June 1991 Vol. 4 Nº 9 Price £2.00

Archive

The Subscription Magazine for Archimedes Users

Creating the right Impression

Computer Astronomy

A Taste of I-APL

Silent Computing – Is it possible?

Reviews: DrawPlus, Schema, Careware 4 & 6, Shareware 37 & 39, DTP Seeds, ShowPage, R.U. Compilation Disc, Maddingly Hall, Speech!, PEP SpeechSystem, DTP Clip Art, Chess, Minerva Business Accounts.

Is Archive a User Group?

Archive is not a user group, although we have always tried to keep that "user group feel" by encouraging readers to contribute their own ideas, articles, questions, small ads, contacts etc. We have also always tried to remain independent, as far as that is possible for a commercial enterprise. To this end, we have deliberately not got involved in developing our own hardware and software products even though we have the necessary knowledge and expertise to do so. This means that, hopefully, you can trust the reviews to be reasonably impartial.

Blatant advertising?

Another thing we have avoided is taking up lots of pages of the magazine advertising our own wares. However, we have found that many new subscribers don't know, for example, that we issue a monthly program disc or that we have a huge PD software library, much of which is dedicated to raising money for charity (over £30,000 in the last 2 years). They don't realise that we do Archive magazine binders or that we have asked a promotional company to make us some Archive mugs! (See Products Available.) So we have taken up a half page advert to make these things known. *(Well, we are going to next month, but when I was pasting up this issue, I forgot to leave space for it!)*

Hard times ahead?

Many businesses are finding things difficult in the current economic climate and Norwich Computer Services is not immune from these pressures. There is always the temptation is to drop your selling prices in order to attract business away from other companies who are selling the same things. The trouble is that it means that other companies, to avoid losing business, may have to drop their prices too. This sounds great from the consumers' point of view... but is it?

The problem is that if everyone cuts their margins, many Acorn-specific companies will not be able to make enough money to live on and may be forced into diversifying into other computers or giving up on Acorn all together. (I personally would rather go back into full time F.E. teaching than do that!) Also, those companies that do stick with Acorn will not be able to afford to employ as many (or as competent) technical back-up staff. All in all, this means *less* support for Acorn products and that is *not* in the consumers' best interests. For companies to behave in this way is, I believe, both short-sighted and selfish.

Advertising Policy

We are, therefore, saying to companies wanting to quote cut-throat prices in our magazine that we are no longer prepared to accept their advertisements. We do not accept their argument that "So-and-so is doing it, so I'm only matching his prices." Our only slight worry is that we may be accused of not being independent any more but we believe that what we are doing is in the interests of the Acorn market as a whole, so the decision stands. (In case you are wondering, we are not the only magazine that places restrictions on its prospective advertisers!)

Very best wishes,

Paul B.

Here are two sayings from the bible. They are very short but very profound....

Better a little with the fear of the Lord
than great wealth with turmoil

Proverbs ch 15 v 16

In Christ are hidden all the treasures of wisdom and knowledge.

Colossians ch 2 v 3

Archive

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Archive magazine is edited by Paul Beverley and published by Norwich Computer Services.
96a Vauxhall Street, Norwich, NR2 2SD. (0603)-766592 ***(Fax 764011)***

Products Available

• **3D Chess** – MicroPower have now released their new chess program and it's in 3D. I don't know how good a game it plays but the 3D display is very impressive. £19.95 from Micro-Power or £19 through Archive.

• **Animynd Life** is a version of John Conway's Mathematical game, Life. It has a wide range of features allowing you, for example, to load and save patterns, randomize, single step, set up various parameters etc. It comes with a library of around 70 shapes, some of which are quite fascinating to watch, and costs £20 from R.R. Thomas, 9 Oughtonhead Way, Hitchin, Herts. SG5 2JZ.

• **Archimedes for the Anxious** is a book by Alison Tyldesley published by RESOURCE, price £4.95. It is a "very-beginners' guide" to the Archimedes "written in plain English" including explanations about using Draw and PenDown.

• **Archive Mugs** – We have just ordered some special pottery mugs for Archive subscribers. They are from the same company that did the promotional mugs for Acorn Computers and those who have seen the mugs they produced for Acorn will know that they are good quality. The design is basically the Archive logo from the front of the magazine in black and reflex blue on a white mug. They cost £3 each + £1 p&p, or £10 for four + £2 p&p.

• **ArcComm 2** is now available from Longman Logotron. This is a fully RISC-OS compatible comms package costing £54 +VAT or £59 through Archive. It supports a range of different modems, has many different file transfer protocols and terminal types. It also has an extended procedure language which makes it very easy to, say, automatically log on to a bulletin board or to Telecom Gold and download mail and upload messages or files. *(I am using it myself and finding it very good. Peter Gaunt, the author, is available on Arcade BBS, 081–654–2212, and was very helpful in getting ArcComm 2 working with my slightly odd WS3000. Ed)*

• **Arcventure** – is an archaeological expedition into Roman Times. It is a simulation in which pupils take part in an archaeological dig with all sorts of interesting 'finds' to be made. £29.95 from Sherston Software.

• **Boogie Buggy** – Looks like a fascinating new game from 4th Dimension. You have to navigate a bug-like creature around the screen in an effort to neutralise the power of an evil monster lord without, yourself, being damaged beyond repair. From the advertising blurb, the graphics look good and it claims to be "the first quality game to use the entire screen". £24.95 from 4th Dimension or £23 through Archive.

• **Broadcast Loader** – Educational Econet users will be pleased to hear about Acorn's new 'Broadcast Loader' which greatly reduces the time taken for a class of pupils to receive the same file(s) which they request from the file-server. A site licence costs £69 +VAT from Acorn or £75 through Archive. Acorn say it is "complementary to Acorn's Econet and Level-4 File Server" and that it is "independent of the type of fileserver in use" and also that it is "compatible with Level-2, Level-3 and Nexus".

• **Chocks Away 'Extra Missions'** from 4th Dimension is now available at £19.95 (or £19 through Archive). It provides you with 26 additional missions to fly, 6 of which are reconnaissance missions.

• **Cross-32 Meta Assembler** – Baildon Electronics have recently released, under licence to Universal Cross Assemblers, Cross-32 which will allow you to assemble programs from a wide range of microprocessors and micro-controllers. It can be driven from RISC-OS or from the command line. The rrp is £175 +VAT and it is available through Farnell Electronic Components.

• **DrawAid** is a utility costing just £10 from Carvic Manufacturing which allows you to create Draw files of complex shapes that have repeating patterns. It provides you with an environment which will allow you to use BASIC to generate your patterns.

• **Guardians of the Labyrinth** is a new maze-based adventure game – £3.49 from Soft Rock Software. It has ten user selectable mazes with the ability to load and save your game position.

• **House of Numbers** – an educational program with three levels of difficulty aimed at children aged 6 to 13. It is centred around a maths adventure/puzzle program. £22 +VAT from Chalksoft Ltd or £24 through Archive.

• **I/O Box 3000** – Unilab have produced an interface box that plugs in the back of the A3000 and provides three user ports, an analogue port and a 1 MHz bus. One of the user ports has been put on a connector with the same number of pins as the printer port on the BBC Micro for backwards compatibility with hardware designed to hang on a BBC. The cost is £77.58 +VAT.

• **!MapIT** claims to be the first Genesis II application. !MapIT, costing £32 from HM Associates, analyses the IT requirements of the National Curriculum. The National Curriculum identifies IT as a cross curricular skill which must be delivered as an integral part of all ten statutory subjects to all pupils aged from 5 to 16 and !MapIT enables you to examine the contribution that IT can make to these ten subjects. !MapIT uses, and is distributed with, the Genesis II browser so you do not need to have Genesis II to use !MapIT.

• **PenDown Outline Fonts Disc** – Longman Logotron have now released a disc of outline fonts, ostensibly for use with PenDown but which can be used with any application capable of dealing with outline fonts. There are 12 fonts – all what you might call fancy fonts – for £18 +VAT or £19 through Archive.

• **Removable SCSI Drives** – The prices of the MR45 removable SCSI drives have dropped even further! We've been able to take a further £40 off the price bringing it down to £755 with an Oak SCSI podule and £555 without (or £735 with a Lingenuity podule) and the spare 42M cartridges are now down to £75 each. (We are now on top discount rate with the importers, so apart from changes in the dollar exchange rate, the prices should now be stable.)

• **Sellardore Tales** – is an 'easy read' adventure game for slow learners, priced £24 +VAT from Sherston Software. It covers National Curriculum English AT2.

• **Shareware Nº40** – contains a simple card based database (ADFS only), desktop ARM code disassembler, 256-level greyscale picture editor, desktop optical character recognition, Blackjack for up to 4 players, Connect4 (2 player or player vs computer), single player high/low card game, horse racing game, sliding block puzzles, screen saver utility, desktop Mandelbrot generator plus a number of utilities: set the access status of files, file type guesser, simple calculator, various desktop file utilities in one program, German key caps, desktop reset button, extra desktop star commands, Fahrenheit <–> Celsius converter, desktop volume control.

• **Training Courses** – (I suppose you could say that these are "Products Available".) Acorn's Training Centre is offering a new series of training courses for applications programmers. The titles are, "Programmers' Introduction to C", "Introduction to Application Programming" and "Advanced RISC-OS Application Programming". More details from the Acorn Training Centre.

• **!X Terminal** – Gnome Computers have produced software that will turn your Archimedes into a terminal to any type of remote workstation working under X 11. It supports TCP/IP over both Econet and Ethernet, can provide support for up to eight independent X screens and includes network security through DES encryption. !X costs £199 +VAT.

Review software received...

We have received review copies of the following software and hardware: Archimedes for the Anxious, Animynd Life, ArcComm 2, 'Children's' graphics library from Micro Studios, DrawAid, 3D Chess, Pendown Fonts Disc, House of Numbers, Viewpoints and Arcventure from Sherston Software. A

STOP PRESS! – Careware Nº 13 is now available including DrawPlus (see the review on page 19). See Price List for details.

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Hints and Tips

• **Beware spaces** – There is a problem with spaces at the end of OS variables:

If you include in a !Run file code such as the following:

```
Set ThisApp$Dir <Obey$Dir>
Run <ThisApp$Dir>.!RunImage
```

then beware that you don't include a space at the end of the first line! If you do, the space will be included in the definition of ThisApp$Dir and the second line will cause a "Bad File Name" error. Hugh Eagle.

• **PC emulator with an ARM3** – The default boot-up process for the ARM3 performs an RMClear command, killing all RAM resident modules including, in particular, the module that drives the ARM3. So, in order, to get the PC emulator to take advantage of the ARM3's extra speed you need to alter the line in !PC.Genboot.!Config immediately after the one that reads "Perform RMClear?" from "Y" to "N"! (Thanks to Martin Coulson of Atomwide for this advice.) Hugh Eagle

• **Printer tips** – You can alter the halftone density by editing the PrData file within your printer driver (see Archive 4.6 for an example of how to find this). For instance, PrinterLJ has lines such as:

```
pxres_halftone:300/8
pyres_halftone:300/8
```

so each halftone dot is actually formed of a matrix of 8x8 dots, giving a halftone density of 300/8=37.5 dpi. This gives a very coarse effect but can produce 65 different grey levels. Altering the lines to:

```
pxres_halftone:300/6
pyres_halftone:300/6
```

gives "only" 37 grey levels and a dot pitch of 50 dpi. Experiment to see what suits your printer best.

A word of caution. I used !Draw to produce some PCB artwork, printed it out using !PrinterLJ on a DeskJet Plus and sent it off... Disaster! The size was OK across the width but was 1.5% too small along the length of the paper, as was discovered when the finished circuit boards came back. I'd previously had no trouble using an Epson-compatible printer, so it may be something to do with the friction feed on the HP slipping, or perhaps a slightly thicker paper would have helped. Anyway, if your hard copy must be accurate, then *check it!* Jonathan Oakley, Cambridge.

• **Printing * command output** – Ever since I got my LaserDirect I have been laboriously printing the results of *Status, *Dump, etc. by directing the output to a file and then printing the file (while bemoaning the loss of the <Ctrl-B>, etc. facility à la BBC). However, I have just realised that it is easier (and much more in keeping with Acorn's RISC-OS standards, I am sure) to open a Task Window in !Edit, enter the * command (which puts its output in the window) and then print the contents of the window by "saving" to the printer driver icon. In other words, click <menu> on the !Edit icon on the icon bar and use Create – New Task window. This presents you with a new window with a * ready for a command. Type in the command whose output you want listing, say, *STATUS. When the listing has finished, click on the window with <menu> and go Edit – Save and drop the text file produced onto your printer icon. Easy! (Then close the window, answering 'Yes' to 'Kill and close'.) Hugh Eagle

• **Printing via a RISC-OS printer driver from a BASIC program** – Have you ever wondered why your computer has a button called "Print" that doesn't seem to do anything of the sort?

At last, applications seem to be appearing that recognise that pressing the <Print> key is rather an intuitive way of printing (Impression and Poster are two examples). Also, I have discovered that RISC-OS printer drivers are not nearly as fearsome as the PRM makes them seem and it is actually quite easy to incorporate into your own program's printing routines which are activated by ... wait for it ... the <Print> key. Amazing!

Take the Painting application from the original Arthurian Welcome disc, for instance. We still use this in my family because it is so simple, but it has always (incredibly) lacked a printing facility. To rectify this, proceed as follows:

Put this line near the beginning of the program (e.g. immediately after PROCdesktop (at about line 200):

```
PROCPrintSetup(110000)
```

Note: 110,000 bytes is big enough to allow the program to run in mode 20. 55,000 would be enough for mode 12.

Put this line in the WimpPoll loop (e.g. immediately after the ENDCASE statement at around line 400):

```
IF INKEY-33 THEN
    PROCPrint(162,232,1274,972)
```

Note: INKEY-33 is the crucial function that recognises whether the <Print> key is being pressed.

Finally, put these procedures at the end of the program:

```
DEF PROCPrintSetup(SpriteAreaSize%)
DIM SpriteArea% SpriteAreaSize%
!SpriteArea%=SpriteAreaSize%
SpriteArea%!8=16
SYS "OS_SpriteOp",9+256,SpriteArea%
ENDPROC

DEF PROCPrint(X1%,Y1%,X2%,Y2%)
SYS "Hourglass_On"
PrintHandle%=OPENOUT("printer:")
SYS "PDriver_SelectJob",PrintHandle%
                              ,0 TO Old%
ON ERROR LOCAL PROCPrintError

MOVE X1%,Y1%:MOVE X2%,Y2%
SYS "OS_SpriteOp",14+256,
SpriteArea%,"TempSprite",1 : REM Get
                                  sprite

DIM RectBlock% 15,Transform%
15,PrintPosition% 7
RectID%=1
BackCol%=&FFFFFF00:REM set
background colour to white

REM X1%, Y1%, etc. are the screen
          coordinates of the area
                        to be printed
!RectBlock%=X1%:RectBlock%!4=Y1%
RectBlock%!8=X2%:RectBlock%!12=Y2%

REM No scaling or rotation required
!Transform%=&10000:Transform%!4=0
Transform%!8=0:Transform%!12=&10000

REM Put the bottom LH corner 1.5"
REM from the left AND 5" from the
REM bottom of the page
!PrintPosition%=1.5*72000
PrintPosition%!4=5*72000

SYS "PDriver_GiveRectangle",RectID%,
              RectBlock%,Transform%,
             PrintPosition%,BackCol%
SYS "PDriver_DrawPage",1,RectBlock%,
               0,0 TO More%,,RectID%
WHILE More%
  SYS "OS_SpriteOp",34+256
           ,SpriteArea%,"TempSprite"
                          ,X1%,Y1%,0
  SYS "PDriver_GetRectangle",,
       RectBlock% TO More%,,RectID%
ENDWHILE
SYS "PDriver_EndJob",PrintHandle%
SYS "Hourglass_Smash"
CLOSE#(PrintHandle%)
ENDPROC

DEF PROCPrintError
SYS "PDriver_Abort",PrintHandle%
SYS "Hourglass_Smash"
CLOSE#(PrintHandle%)
ENDPROC
```

Hugh Eagle

• **Running one application from inside another**

If you've ever been puzzled by odd behaviour when you try to run one application from inside another, the following advice from Mark Neves of Computer Concepts' Technical Support Department may help.

My particular problem arose when I tried to make sure that a printer driver was loaded by running !PrinterXX from within application A's !Run file. The result was that application A failed to run and when I quit !PrinterXX, an error was reported.

The answer is that when you run a "sibling task" from another application's run file the sibling "takes over the current environment" until it terminates and only then does it return control to the parent task (in a manner analogous to a subroutine call).

The solution is to use the command

```
* Desktop <sibling task name>
```

rather than *Run. Hugh Eagle

• **"Saving" data from one application to another** – (This is another of those "obvious to those who know it" hints.) If you want to transfer data (e.g. text or a sprite or a drawn object) from one RISC-OS application to another you don't have to save it on a disc from application A and then load it into application B; all you have to do is drag the icon from application A's "Save" box (i.e. the window that appears when you choose a Save menu option) into application B's window.

This works with all well behaved ("RISC-OS compliant") applications, e.g. !Edit, !Draw, Impression, !Paint, !Poster, etc. and generally works for either the whole contents of a window or for selected items. Hugh Eagle

• **Sprite plotting and colour translation** – The ColourTrans section of the PRM (pages 1399 to 1424) includes references to a number of SWI's (including, in particular, ColourTrans_SelectTable) which have to be called with R1 pointing to the "source palette". Since, according to PRM pages 390–391, a sprite's palette data starts 44 bytes after the beginning of the sprite, it seems clear that, in order to translate a sprite's palette you simply call the ColourTrans SWI with SpritePointer%+44 in R1, doesn't it? Wrong!!!

In fact, the palette data in a sprite appears to include 8 bytes for each colour with the second 4 bytes duplicating the first 4 (does anyone know why this is?) whereas ColourTrans expects only 4 bytes per colour.

So, before you can translate a sprite's colours, you need to include some code on the following lines:–

```
PaletteLength%=SpritePointer%!32-44
IF PaletteLength%=0 THEN
                    PalettePointer%=0
ELSE
 FOR I%=0 TO PaletteLength%-8 STEP 8
  Palette%!(I%/2) =
              SpritePointer%!(I%+44)
 NEXT
 PalettePointer%=Palette%
ENDIF
```

Note: The palette data, if any, starts 44 bytes after the beginning of the sprite. SpritePointer%!32 contains the number of bytes from the beginning of the sprite to the start of the actual sprite pixel data. If this equals 44, there is no palette.

The point of setting PalettePointer% to 0 if there is no palette data, is that if the sprite has no palette then, in many cases, (especially if the sprite is defined in a 256 colour mode) it makes sense to call ColourTrans with R1 set to 0 since ColourTrans will then translate the default palette for the sprite's mode. However ...

• **Strange sprite colours** – Ever since RISC-OS arrived, I've been puzzled by the odd colours which have appeared when some sprites have been plotted by various applications (including Impression, no less). I think that, at last, I'm beginning to understand why. Consider the following curious state of affairs:

Palette details are an optional part of the sprite data format. A lot of sprites are created by !Paint. !Paint, by default, creates sprites without a palette (presumably on the assumption that, having been designed in the Desktop colour scheme, they will be used on the Desktop.)

The PRM (page 1278) recommends that you should use the ColourTrans module for best results when plotting or printing a sprite. However, although ColourTrans knows how to translate from any given palette and from the default palette for any mode, it doesn't seem to be equipped with any means of translating the standard *desktop* palette of a mode other than the current one.

Therefore, the best that applications can do when faced with a palette-less sprite is to tell ColourTrans to assume that the sprite was defined in the default palette for its mode. The trouble with this is that it is about the worst possible thing that can be done with a sprite defined to be used on the

Desktop since, for instance, colour 0 which is intended to be white, will be translated by ColourTrans, working from the default palette, into black! For example, even Impression reverses the colours of its standard document icon.

So, what's to be done? As far as I can tell:

The best advice is to make sure that every sprite has a palette. If this isn't possible then, for plotting sprites on the Desktop, use Wimp_ReadPixTrans if a sprite doesn't have a palette (this is the routine that the Wimp manager uses for plotting sprites as icons and seems to produce quite acceptable results on the whole) and save ColourTrans calls for sprites that do have palettes. For example, follow the above palette conversion routine with code something like this:

```
SYS "ColourTrans_SelectTable",Mode%,
PalettePointer%,-1,-1,ColTable%
IF PaletteLength%<>0 THEN
  SYS "OS_SpriteOp",52+512,Sprites%
            ,SpritePointer%,200,200,
            Mask%*8,Scale%,ColTable%
ELSE
  IF NumberOfColoursInSprite%<63
THEN SYS "Wimp_ReadPixTrans", 512,
             Sprites%,SpritePointer%
                      ,,,,,ColTable%
  SYS "OS_SpriteOp",52+512,Sprites%,
             SpritePointer%,200,200,
            Mask%*8,Scale%,ColTable%
ENDIF
```

If you're plotting to a printer, "Wimp_ReadPixTrans" doesn't help and I don't think there is any straightforward, foolproof method. (It would be possible, I think, to create a block of palette data with the RGB values for the colours of the Desktop palette in the relevant mode and then feed this into ColourTrans, but this would be a rather tedious process.) Hugh Eagle

Impression Hints and Tips

• **Adding fonts by using search & replace** – As a mathematics and physics teacher, I use a lot of Greek letters and it is rather bothersome to have to work through all those menus to reach the effect "Greek" every time. Therefore, I use search & replace in a way which (at least in the Impression Junior handbook) is not documented:

I type the text, using the Latin equivalents of the Greek letters ("g-Quant" instead of "γ-Quant") then, when I have finished the text, I use the following:

Find: g-Quant

Replace: {font Greek}g{font}-Quant

Impression does the rest. (Many thanks to Computer Concepts for the information!)

By the way, if you wish to find out how all the other effects are saved in an Impression document, there is an easy way to find out: Just take a document with lots of effects and save only the text story ("with effects"). If you then drag the icon of the saved text story onto the !Edit icon, the text will appear with all the effects in plain language. Jochen Konietzko, Koeln, Germany

(Wouldn't it be easier to use <ctrl-F6> and edit the "Greek" style, go down to the bottom where it says "Key short-cut", click in the box and press, say, <ctrl-shift-F9>, then OK it? Then when you want, say, "g-Quant", you type "<ctrl-shift-F9>g<ctrl-shift-F9>-Quant".... Oh, I see, Impression Junior doesn't have styles. Oh well, nice try!)

• **Cutting invisible text** – If you have more text in a frame than will fit, you get the little red arrow which indicates that some of the text is invisible. You could obviously create a new frame, click on the over-full frame and then click <adjust> on the new frame but there may still be too much for that frame. So, is there any way of marking the invisible text so that you can cut it or copy it? The answer is that you simply use <ctrl-down> to move the cursor to the (invisible) bottom of the text the click <adjust> to indicate the upper limit of the area to be marked. Ed.

• **Handy hint** – If you use the 'hand' to move up or down through a long document, you are not limited in your movements to the visible page. In other words, if you keep moving the mouse up and up (by repeatedly lifting the mouse off the table) or down and down, you just keep moving through the document in the desired direction.

(This is particularly useful if you are a trackerball user!) Ed.

• **Importing text files into Impression** – In the new version of Impression which CC have just sent me (version 2.11), I have discovered an exciting new concept in the Archimedes world – "the Return Stripper"!!

In the Extensions directory is a new loader module called "LoadReturn" which at last seems to deal satisfactorily with the importing of text files. Using this, I no longer have to load the file into !Edit then change linefeeds into carriage returns before importing. Nor do I have to suffer fixed line lengths in the imported text.

However, I do have two quibbles (some people are never satisfied!):

Double carriage returns are reduced to single returns, so spaces between paragraphs are eliminated (unless you change the style so that it leaves such a space – *which I think is good practice. Ed*). I feel it would be helpful to be able to set a "preference" to decide whether or not double returns are preserved.

Importing a text file now involves a somewhat tiresome sequence of message windows whereby I am asked to accept or reject each of the available loader modules in turn. I feel it would be helpful to be able to use the "preference" facility either to define which loader is used for which filetype or, at the very least, to determine the order in which the various loader options are offered to me. Hugh Eagle.

(All I did was to put the LoadReturn extension into the Auto directory in the Impression directory and now when I want files stripping, I use !Settype (Shareware 19 or 23) to change them to Acorn data file type (&FFD) and they are stripped automatically. Ed.)

• **Labels & Tickets** – Another way of doing tickets and labels is to define a new master page which is the *right size* for what you want to create (pretty radical, eh?). "Fit lots" still works, giving you multiple tickets per sheet, but you're not restricted to 1% size increments which can cause you to miss the boundaries on sticky labels, especially where there are three or four across the page width. *(Brilliant! Why didn't I think of that? Ed. – see below.)*

A similar technique works for cassette inlays. One way is to define a single master page 101mm deep and 288mm wide, divided into columns of 16, 12, 65, 65, 65 and 65mm; this format will fit two inlays to an A4 page (assuming zero border width, which will vary between printers), but you need to fiddle around with !FontDraw and !Draw *(Or use Draw1½ – see below. Ed)* to get text on the spine of the cassette. Starting with a page 288mm deep and 101mm wide gives you the spine text a sensible way round, but the four "body" pages are then landscape, which you may not want.

Another way is to split the inlay into two chapters; the spine has a 101mm wide, 28mm high master page, and the body pages are 65mm by 101mm, or vice versa if you want landscape. Then you need to do a bit of cutting and pasting by hand, as Impression won't print individual pages sideways. This is the technique I ended up by using, printing at 141% then reducing the pasted-up result from two up on A3 back down by 70% to A4, thus enhancing the graphics halftones from 37.5 dpi to 53.6 dpi. I've included an example ... *(Which we have put on the Monthly Program Disc. Ed)* Jonathan Oakley, Cambridge.

• **Labels & tickets** – Ed's version – I have played a bit with Jonathan's ideas and developed them a little. I tried to create some labels (like the ones on our Shareware Discs etc which come as 24 to an A4 page) and found that his method worked very well. I created a master page that was 70mm x 37.125mm (which is 210mm divided by 3 horizontally and 297mm divided by 8 vertically). I set a border 3mm wide on all four sides because the Laser Direct HiRes can print up to about 2.5mm of the edge of the page and I wanted to have a simple line border around my labels. I put all my text on the master page including a page number so that I could have a serial number on the labels. I then closed the master page and created another 23 pages for my document by using <menu> Edit – Insert new page. I clicked 22 times with <adjust> so that the menu stayed on screen and once with <select>. I then

pressed <print> and clicked on "Fit lots" and then "Setup..." and then "Ignore page border". The printout which appeared was almost right but was 1mm too far to the right, 1mm too low at the top and the last label was even lower. *(Thinks hard.... tries various things and then....)* The printout was slightly too long so I created a slightly shorter master page – 70mm x 37.11mm. I tried to see if there was any adjustment on the laser printer but couldn't find any so I went to the (new, shorter) master page, clicked on the frame and pressed <ctrl-F10> to alter the frame. In the position section, I simply increased X from 5 to 6 and reduced Y from 5 to 4 in order to move the text on the page 1 mm right and 1 mm up. Bingo! Every border on every label was almost exactly 5mm.

I also had a quick try with Jonathan's cassette inlay printing and it is really very easy with his first method – I cheated though by using Draw1½ (Shareware 34). For the spine, all you do is create a new Draw1½ document, type in the text you want, change it to whatever font you are using, press <menu> – Special – Text to path and then <menu> – Save – Selection and drop the Draw file produced into the relevant graphics frame in your Impression document. Then use <adjust> to drag the picture round until it is near enough at right angles to the rest of the text (having decided which way you want it to face) and finally press <ctrl-F11> (Alter graphic) and set the Angle to exactly 90° or 270°. (If you can remember which way round 90° or 270° puts it, then there's no need to swing it round with <adjust>.) Here is a bit of text that I have just inserted. It must have taken me all of 45 seconds to create the frame, type in the text, convert it and add it in! (Software to enable me to do that on the Mac cost me hundreds of pounds a couple of years ago!)

Hello Mother!

• **"Running" an Impression document** – In Alan Highet's review of !Menon on Shareware 38 (Archive 4.8 page 48) he mentions that it did not work well with Impression documents since an attempt to "run" one of these caused a second copy of Impression to appear on the icon bar.

I have observed a similar phenomenon in trying to create a front-end for Impression which, amongst other things, opens a template document chosen by the user. Simply *Running the document results in the loading of a new copy of Impression regardless of whether one is already running.

So, why is it that double-clicking on an Impression document in a Filer window will load it into an existing copy of Impression whereas "running" it doesn't?

Mark Neves of Computer Concepts' Technical Support Department has kindly explained why this happens and has pointed to a solution.

The reason is that what happens when you double click on an icon in a Filer window is not simply that the document is "run". First, the Filer broadcasts a Message_DataOpen message inviting other applications to open the document, and only if this message is returned unacknowledged does it instigate a *Run.

The solution is a fairly simple program on the following lines:

```
REM >!RunImage
TaskName$="RunImpDoc"
:
PROCSetUpWimp
DocToOpen$=FNReadOSVarVal
                        ("Doc$ToOpen")
PROCPollLoop
SYS "Wimp_CloseDown",Taskid%
                              ,&4B534154
IF NotAcknowledged% THEN OSCLI("Run
                        "+DocToOpen$)
END
:
DEF PROCPollLoop
LOCAL mask%,quit%
NotAcknowledged%=FALSE
PROCSendDataOpenMessage
mask%=0
quit%=FALSE
REPEAT
SYS "Wimp_Poll",mask%,block% TO
                                 reason%
CASE reason% OF
WHEN 17,18 : IF block%!16=4 THEN
                              quit%=TRUE
```

```
 REM Another task (presumably
 REM Impression) has acknowledged
 REM our request to load a file.
WHEN 19  :
NotAcknowledged%=TRUE:quit%=TRUE
 REM Our request has not been
                        acknowledged.
ENDCASE
UNTIL quit%
ENDPROC
:
DEF PROCSendDataOpenMessage
!block%=256
block%!12=0:block%!16=5:block%!20=0
block%!28=0:block%!32=0:block%!36=0
block%!40=&2000
$(block%+44)=DocToOpen$
?(block%+44+LEN(DocToOpen$))=0
SYS "Wimp_SendMessage",18,block%,0
ENDPROC
:
DEF PROCSetUpWimp
DIM block% &1000,errblk% 256
REM
Taskid%=FNWimpInit(200,TaskName$)
SYS "Wimp_Initialise",200,
              &4B534154,TaskName$ TO
                    Version%,Taskid%
ON ERROR PROCError(TaskName$)
ENDPROC
:
DEF FNReadOSVarVal(varname$)
LOCAL templ%,temp2%,length%
DIM templ% 100,temp2% 100
$temp2%=varname$
SYS "OS_ReadVarVal",temp2%,templ%,
                 100,0,3 TO ,,length%
templ%?length%=13
var$=$templ%
=var$
:
DEF PROCError(TaskName$)
!errblk%=ERR
$(errblk%+4)=REPORT$+" at line "+
                                STR$ERL
errblk%?(4+LEN$(errblk%+4))=0
SYS "Wimp_ReportError",errblk%,1,
                              TaskName$
SYS "Wimp_CloseDown",Taskid%,
                              &4B534154:END
ENDPROC
```

To use this program, simply set up the OS variable Doc$ToOpen with the full pathname of the document and run the program. Hugh Eagle

• **Setting a style in an Impression frame** – Question: how do I set up a blank frame containing a predetermined style (for instance, to hold the address of the person I am writing to, where I would like to use a different font from the one in the body of the letter)? If I put the cursor in the frame, then apply the style, then move the cursor elsewhere (or save and reload the document) before bringing it back to the address frame, and then start typing, the text comes up in the Basestyle.

Answer: If after applying the style, I type anything (for instance a couple of carriage returns) in the address frame then the applied style seems to be remembered and the address frame works as intended.

Caution: if I delete the entire contents of the frame the applied style is deleted too. So, if I want to blank the frame for reuse I have to remember to leave a carriage return or two to preserve the style. Hugh Eagle.

• **Typesetting** – We said we would try to find companies willing to do typesetting from Impression output. Here are two that we have found. If you discover others, ask them to send us details of their services and we will publish them. We are particularly interested in those that will take Impression files as such rather than PostScript files on MS-DOS discs.

The Type Station in Cardiff offers a full bureau service for bromide or film. You create PostScript files and either send them by post on an MS-DOS disc or send them c/o BT using a modem. For details, contact Elgan Davis on 0222–229977.

Focus Print in Aberdeen can do bromides (PMT's) from your Impression files. Phone Alexander Bisset on 0224–592571 ext 211 (or 0224–593956 evenings). A

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Comment Column

• **Archway** – I have recently received, from Simtron, a copy of their free demo disc for Archway. It's an excellent demo which seems to give a good idea of the kind of results Archway can produce and, more importantly, how you use it. It is well worth a look for those who are interested in writing Wimp applications but have not yet got to grips with all the intricacies of the Window Manager. Hugh Eagle, Horsham.

• **Equasor Update** – Brian Cowan's review of Equasor in Archive 4.6 did not mention the important Design/Apply feature, probably because he had a pre-production version.

Equasor can routinely produce expressions with super- and subscripts to the East such as G^3_{av}. However, the Design/Apply feature allows you design custom subscript positions (up to two per symbol) in any of 8 positions: N, S, E, W, NE, SE, NW and SW. Also, the N and S scripts can be centred over the variable or aligned left or right, and the three E and three W scripts can be spaced out horizontally from the symbol, and similarly the three N ones can be leaded (raised or lowered) by an amount you can set, applicable to the whole Equasor "document".

The new structure can then be applied to a symbol and different structures designed and applied elsewhere. Here are some examples:

$$^{238}_{92}U = ^{234}_{90}Th + ^{4}_{2}He$$

The first 3 atoms were designed using the Design/Apply feature, the fourth by a combination of that on the "H" and the routine subscript feature on the "e" plus a little kerning of the "2+". I like Equaser very much, but my version (1.02) does have a few minor bugs. Steve Kirkby

• **LaserDirect Hi-Res (Canon LBP4)** – I hope you will publish the following comments to encourage anyone who may be wavering about whether to buy a LaserDirect printer. (I wavered far too long!)

Use with RISC-OS drivers – Absolute simplicity. It gives wonderful results (both with text and graphics, especially Drawfiles). It brings Impression to life and we can now actually see the differences between the various fonts! A joy to use.

Use with programs that don't cooperate with RISC-OS drivers – I was quite concerned about how difficult it would be to use with programs such as First Word Plus or Lotus 123 on the PC Emulator. In practice, I have found it surprisingly straightforward:

(i) The LBP4 printer can be plugged permanently into both the LaserDirect card and the parallel port and can be switched between the 2 interfaces just by pressing a few buttons on the control panel.

(ii) With the help of the driver supplied on Careware 12, text printing from First Word Plus via the parallel port is totally straightforward. (Having said that, the question of using First Word Plus has proved academic because we have all rapidly become convinced of the advantages of Impression!)

(iii) Basic text printing from Lotus 123 and any "VDU2" (or <Ctrl>B) style printing (e.g. printing the output from a * command such as *DUMP or *STATUS) is also straightforward. The printer can easily be switched via the control panel between standard and "line printer" mode (i.e. 160 characters by 8 lines per inch) in either portrait or landscape orientation. Software control (via escape sequences) is doubtless possible but you need to buy extra programmer's manuals to get all the necessary details.

(iv) While it is possible to use the parallel interface in this way, it is actually almost as easy to print to a file and then print that file through the LaserDirect RISC-OS driver (or via Impression for all the extra control over layout that it gives.)

Noise – After reading some comments, I had imagined my study sounding like an aircraft hangar with the printer's fan competing with the computer's for attention. In fact, the printer is

scarcely audible most of the time and even when it is printing it is quieter than the computer.

Hugh Eagle, Horsham.

• **Public key cryptography** – A review of "The Public Key", (a magazine specializing in public key cryptography) appeared in Archive 4.5 page 57. Issue 2 of this magazine is now available from: George H. Foot, Waterfall, Uvedale Road, Oxted, Surrey RH8 0EW. A nominal charge of £1.50 (EEC countries £2.50: Overseas air mail £3.50) is made to recover expenses in part – cheques payable to G.H. Foot.

New readers will require Issue 1 of the magazine and the disc containing the cryptographic program in addition to Issue 2. (Inclusive charge: £5.00, EEC countries £6, Overseas £7).

Alternatively, write to the above address for a free descriptive leaflet.

The magazine is produced as a hobby interest of the editors and is not a commercial venture.

The unique merit of public key cryptography is that it is a universal system allowing anyone to communicate securely with any other person without a requirement for any previous contact between them and without any necessity for a preliminary exchange of codes.

The program in the magazine will encrypt messages (including graphics) for onward transmission and decrypt messages which have been received, all in a very simple fashion.

Public key cryptography is an interesting application for the Archimedes computer which will have a fascination for many people and serve a useful purpose for others.

The underlying principles are described for anyone wishing to make a closer study of the subject but no special knowledge is required for the operation of the program.

• **Schema** – Clares replies to the criticisms of Schema in Archive 4.8 p18...

a. The version of Schema to be released soon, does have the ^ operator. Existing users will be receiving upgrades.

b. Only the more common operations are provided on the function keys. Inserting and deleting rows and columns is generally only needed if you make a mistake in the design of your sheet. If you do, the facility is there to correct the error.

c. Schema is an extremely powerful package and far from having too many menus, it is remarkable that it manages to deliver so much power with so few menu options to remember.

d. Inserting a column to the left of Column A is only going to be necessary if you have set up a badly designed sheet. If you do make such an error, the program allows you to rectify it in the way described. It is better to do things this way than to add an extra menu option to cope with a rare situation.

e. VAT, NAME and ARCHIVE for example, could be strings or user names or macros hence the use of quotes to distinguish them.

f. The article talks about a scratchpad. There is no scratchpad in Schema. I think the writer means the entry window. This is a window which displays the contents of the current cell and allows you to edit them. Since the contents of this cell are displayed, naturally, before you can edit data in a cell you have to make that cell the current cell. Once you have clicked into the edit window, you edit your data exactly as in any other editing window in any other RISC-OS application. The mouse and the cursor keys act exactly as you would expect.

D Jackson, Clares

We have had quite a number of letters about Schema expressing a range of views both positive and negative although the balance is on the negative side. However, it seems clear that Colin Ross Malone Ltd, who are doing the programming, are committed to clearing up all the bugs and implementing as many as possible of the facilities which people are requesting. (See also the comparisons between Schema, PipeDream and Logistix on page 27.)

• **Tracer** – Midnight Graphics gave one of our subscribers a copy of Tracer for review. Eventually, he returned it saying he couldn't get it to do what he wanted it to and therefore he didn't want to review it negatively. Another subscriber got a more up-to-date version from them and had a go. He actually wrote a review but it was rather

negative as he wasn't very impressed by what he managed to achieve with Tracer.

Instead of just publishing the review, we faxed a copy of it to Midnight Graphics to give them the right of reply *before* going to press. They said they felt that the review was unfair and pointed us to the fact that they had sold over 600 copies "and have received no negative comments". They also faxed us a sample customer response form as "a sample from many satisfied owners". It was from an IT co-ordinator and gave the simple response, "Excellent!".

I have therefore refrained from publishing the review but would ask that if any of the "over 600" owners of Tracer are subscribers that they drop us a line telling us very briefly what they feel about Tracer. Thanks. Ed. A

Contact Box

• **German bulletin board** – ArcWorld is an Archimedes BBS run by Thomas Fischer. Ring it on +49–7191–23217 using 2400 baud 8n1.

• **Norfolk Schools bulletin board** – Star-Net is run from Eaton (City of Norwich) School by Paul Welbank. It is on 0603–507216 using 300 to 2400 baud (8n1). It is aimed mainly at schools in this area but open to others to call in.

• **Wakefield is 100!** – The Wakefield BBC Micro & Archimedes User Group is having its 100th meeting celebrations on the evening of July 3rd 1991 at Holmfield House, Wakefield. They will have a display of all the Acorn range of machines from the Series One, through the Atom to the A540 and R260. For further information, ring 0924–379778 or –255515 or –250764, evenings or weekends. A

Competition Corner

Colin Singleton

A century or so ago, a puzzle was sold for a penny on the streets of London. It consisted of a peg-board with 36 holes drilled in a six by six square array. Lines were marked joining the holes, six lines horizontally, six vertically, and 18 diagonally, including all the short diagonals. The object of the puzzle was to place six pegs in six of the holes so that no two are connected by a straight line.

The eight by eight puzzle can be worded thus: place eight queens a chess-board so that no queen is attacked by any other queen. They could be placed on squares a4 b2 c8 d5 e7 f1 g5 and h6. This solution has the interesting additional property that no three queens are in a straight line, in any obscure direction.

This last feature is not a requirement of this competition. The problem is to find the *number* of fundamentally different ways in which the puzzle can be solved for n queens on an n by n board, excluding solutions which are rotations or reflections of others.

There is only one solution for n=4, two for n=5, and one for n=6. Please extend this list as far as possible.

The winners!

The January competition involved the calculation of *e* to 1000 decimal places, or as far as possible. I did not penalise those who submitted only 999 dp! The winner on speed, as usual, was Dr Riha of Leeds, whose program took 0.21 sec on an A540. This, I think, is clearly faster than the next best, 1.25 sec on an A3000.

The latter time was recorded by Andrew Wallace of Harlow, who wins the endurance prize for having calculated 1 million places in slightly over a week! His timings for around 100000 places were faster than those of others who actually carried out the calculation, rather than simply estimating the time.

No prizes for the shortest program, submitted by an entrant at Birmingham University, using an algebra package. Apart from a few control directives, the 'program' consisted of the expression to be evaluated, which is the single letter *e!* When you enter these competitions, *you* are supposed to write the programs.

The prize for the February competition (the Mastermind game) is also shared, between J R Thorn of Cardiff and Graham Jones of Durness. They both used essentially the technique I outlined but somehow managed to diverge on the third guess, thereby ending up with very different answers for the 'most awkward' secret number as defined for the competition. The pattern of progress towards this number, however, is very similar in each case and justifies a shared prize. The number is identified on the seventh 'guess'.

Graham's sequence of guesses is 0123 (leaving 3048 possible numbers from the worst reply) then 4567 (leaving 768), 1288 (170), 2619 (32), 9840 (4), 0034 leaving one, which is 8905.

Mr Thorn's sequence is 0123 (leaving 3048 numbers), 4567 (768), 1488 (171), 6399 (30), 5990 (3), 2296 leaving only one possible, which may be 2692 or 2696, depending on the sixth reply.

The *Snap* problem in March produced three entries with a full list of numbers of ocurrences of 0 to 52 snaps. Fortunately they agreed with each other, which saves me having to work it out! I didn't ask for the fastest, so the result is a three-way split between Dr Riha (fastest again!), Joseph Seelig of North Harrow and Cy Booker of Swanley.

Joseph also sent me (on disc) a full list for 208 cards, which took just over 7 minutes to create and involves 393-digit numbers. A reader in Holland related the puzzle to his experience in deciding who should buy Christmas presents for whom. Interesting. I first encountered it in connection with the inefficient secretary who managed to put all the boss's signed letters in the wrong envelopes.

Congratulations to all the winners, especially the three new names on the roll of honour. A

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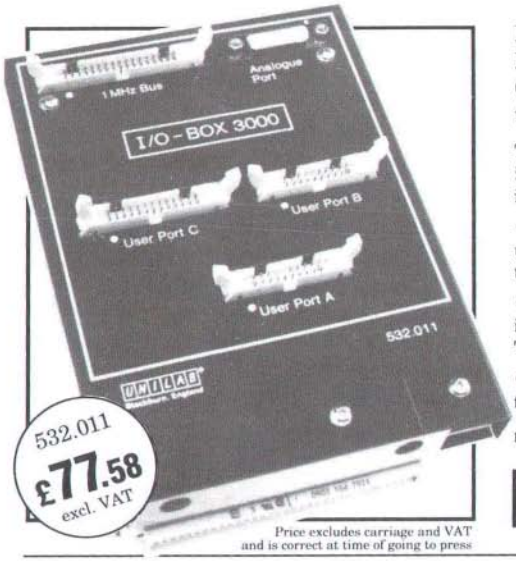

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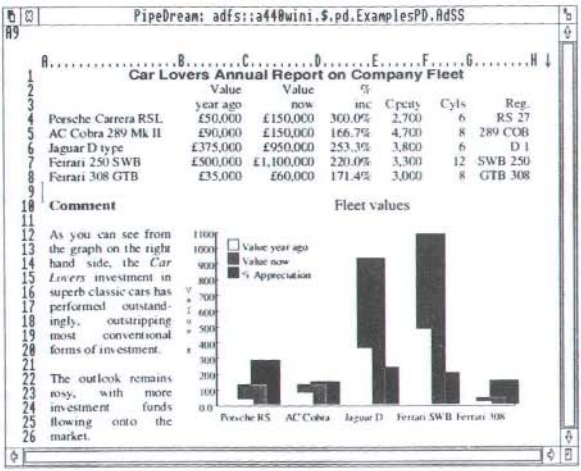

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All trademarks acknowledged. The chart in the screen shown above was produced by sending numbers from PipeDream 3 to Lingenuity's Presenter 2 and then loading the resulting graph back into PipeDream 3.

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Draw Plus – A Much Revised Application

Barry Thompson

It was interesting to read the article by Tord Eriksson in Archive 4.8. It seems that he is using an earlier version of Draw1½. Jonathan Marten has now released version 2.0 and calls it Draw Plus. A considerable number of additions and refinements have turned this application into a very comprehensive page creation program.

Libraries

Imagine being able to create libraries of your most commonly used drawn fonts, electronic symbols and clip art or anything else for that matter. The library can be saved in a file, independent of any drawings, and the objects in it pasted into any drawing.

Layers

Objects can be created on up to thirty one layers. Layers allow related information to be kept together and completed parts of the drawing to be made un-selectable so that there is no danger of accidentally changing them. Information not needed for the moment can be hidden.

Magnification

Clicking <adjust> on the zoom icon in the toolbox gives a range of magnifications from 99:1 down to 1:99. An excellent feature of this is that, having selected an object, clicking <select> on the zoom icon means that the object that is magnified by zooming always appears at the centre of the window.

Beware though of zooming in at large magnifications on hollow objects like rectangles and circles – you end up looking at the white space at the centre of the them. Use the scroll bars to find the section that you require.

Background objects

Another feature, which is useful, is that objects can be set into the background where they become un-selectable so that there is no danger of accidentally changing or moving them. However, this feature may become redundant now that it is possible to draw on layers.

Lines

There are eleven different selectable line styles within the application and all can be edited to suit the user's needs.

Extra menu items

The three icons at the right hand side of the toolbox are used for orthogonal movement of the cursor when creating objects, magnification selection and lastly grid lock. Clicking <adjust> over the last two icons bring up menus from which various options can be set.

Clicking <menu> over a drawing window produces an extremely comprehensive menu. There is only space here to deal with some of the facilities.

Miscellaneous

This includes options on file information, printing, dashes, layers, set objects in and clear objects from the background.

Further options allow sprites, text areas or text in ASCII form to be saved. There is also an option in this menu which enables you to save your favourite preferences and default settings.

Settings

Two items of particular note are: show XY (cursor position) and a setting for automatic window scroll.

Create

This repeats some of the toolbox items with the exception of the polygon option, which has a slide off arrow allowing the number of sides of the polygon to be set (3 to 100 sides).

Select

An option is included whereby objects can be moved one place forward or backwards in the stack that they are in.

Edit

This menu contains items useful when in path edit mode. It has options to make lines truly horizontal or vertical and to straighten curves without changing them to a line. Another option allows curves that intersect to have their joining points smoothed.

Information such as the text and path styles, layer and dash pattern information, grid and zoom options is saved along with the drawing, and these items are restored when it is reloaded.

Text items

The usual features are incorporated including font name, style, size/height, colour and background colour. What makes this section of the program more interesting is the facility of changing the text styles *after* the text has been typed and the return key pressed. How? Select the text then – Menu – Text Style – then change the feature from the menu that you want to change eg. font name, size, style or colour.

Special item menu

This menu option includes facilities which allow text to be converted to path objects, much as FontDraw and FontFX. Text converted to paths can be rotated, skewed, transposed, etc. A text explode menu option allows text characters i.e. words or sentences to be broken into individual parts. These can then be manipulated as individual text items to be kerned, aligned, arranged into vertical text etc.

Alignments

This feature allows objects to be aligned at their top, bottom, right, left or vertical or horizontal centre. Objects can be spaced out equally in the horizontal and vertical plane. There is also a distribute facility which allows the edges of several objects to be distributed evenly to their top, bottom, right, left or vertical or horizontal centre.

Bounding box

Lastly there is an option to draw a bounding box around an object or group of objects. This is a useful feature for drawing an invisible box around an object or group which contain thin lines. In some DTP applications thin lines disappear into the sides of frames and are thus not printed.

Key short cuts

Although most items can be selected by the mouse via menus, page creation can be speeded up by the many function key, ctrl+key, shift+key combinations. For example, Save Page is <F3> <return>, Save Selection is <Shift-F3> <return>, <ctrl-A> selects ALL objects on the page, <ctrl-J> brings up the alignment dialogue box and there are many, many more. One undocumented feature is that, after pressing <F3>, the Save dialogue box always appears under the pointer or cursor, pointing to OK so that you can either click <select> or press <return>.

Finally

As can be gathered from my comments, I am very impressed by this application. My first Capsoft disc *(see Archive 4.7 p 13. Ed.)* was created almost exclusively using this program and all of the later ones are being created using it and it can be thoroughly recommended. It seems to be a much faster program in operation than the original Draw supplied by Acorn.

I have used the various versions of this application almost every day both at work and at home since they were released. Included with the program is an excellent manual in the form of a text file in Edit format and several example libraries and draw files, including a huge London underground map. A

(This is a VERY professional package and I reckon that Jonathan Marten could have made quite a bit of money by selling it professionally. (Mind you, Acorn might have had something to say about that!) Still, if you are using Draw1½ or DrawPlus, why not send Jonathan something to show your appreciation – especially if, like Barry, you are using it in the course of your work. Draw1½ is available on Shareware Nº34 but this latest version, DrawPlus, is so good that we are making it available as one of the programs on Careware Nº13 which is now available. Ed.)

Help!!!!

• **Armadeus sound sample distortion** – When a standard relocatable sample module such as StringLib is played, SYS "Sound_Control" can be used to alter the pitch and volume. However, modules created by Armadeus suffer from serious distortion if this command is used. Does anyone have a solution? Jeremy Mears, 21 Collum End Rise, Leckhampton, Cheltenham, GL5 0PA. A

PipeLine

Gerald Fitton

PipeLine is many things to many people. It started, and continues, as this monthly column you are reading which appeared first in the October 1989. Later, I made the information available to a wider audience (i.e. those who were not Archive readers) by producing a quarterly disc. Although those who bought the first PipeLine disc (July 1990) were exclusively Archive readers, I now have many subscribers who bought a PipeLine disc first and, through it, learned of Archive magazine. These PipeLine subscribers are now Archive readers as well.

More recently, PipeLine has evolved into a focus for exchange of problems with, and ideas for, users of PipeDream – a sort of PipeDream User's Club. We have built up a team of 'PipeLine Helpers' who are expert in different specialist areas (such as text, spreadsheet and database file conversion from 'alien' packages) which they are able and willing to support.

If you use PipeDream in a way that you find interesting enough to want to show others (and help them with their problems), please write to me (at the Abacus Training address on the inside rear cover of Archive) and let me know. What do you get in return? Firstly, lots of thanks (and new friends) from those with whom you correspond. Secondly, if you write up your experiences and I publish it on a PipeLine disc, you get a refund of the disc price and a free disc.

Paul's hint

Yes! Paul Beverley is an ardent PipeDream user. Here is a partial solution to a problem that I have been asked a dozen times or more. Paul's version of the problem (and his solution) is that he wants to identify those rows in a spreadsheet which have a column containing numbers lying between two values. He quotes as his example a sheet with a (long) column of numbers, column L, in which he wants to identify those rows which contain values between 499 and 501. The method Paul uses (slightly modified by me) is to insert a new column A (place the cursor in column B and use <Ctrl-F3>), place the cursor in the new column A and use <Ctrl-LFC> to fix it. Note that your old column L is now column M.

In A1 put the higher of the two values of the range (in this example 501) and the lower value (499) in A2; remember that these must be numbers and not text; use <F2> to enter a number or an expression. In the next cell, A3, enter the expression if(M3<A$1&M3>A$2,M3,0) and replicate it down the whole sheet. Below the last entry (e.g. A499), in say A500, enter the expression sum(A3A499)*2/(A1+A2). The expression in A500 will evaluate to the number of rows in which a value between 499 and 501 occurs between M3 and M499. If you <Tab> across the sheet and <Page Down> with column A fixed you will quickly pick up the rows you want. Of course, a selective Save (using the 'Save selection of rows' dialogue boxes) to a new file will collect together the rows you want and no other rows.

The growing file

Howard Snow loaded an 80K file having over 10,000 rows from a PipeLine disc, sorted it on one of the columns and then tried to resave it. The PipeLine discs are pretty well full and he got the error message 'Disc full'. He saved to another disc and found that the file had grown by about 10K! He sent me the larger file. I loaded it, saved it, and it shrank back to 80K! After many red herrings, it took Robert Macmillan to come up with the solution. It was nothing to do with V 3.10 against V 3.14 (still the latest version) and nothing to do with sorting but it was the now well known ini problem (first recorded by Stephen Gaynor) in another guise. Howard's ini file contains the default Line separator (see the Files – Save – Line separator dialogue box) CR,LF (or LF,CR) whereas mine contains LF on its own. Whenever Howard came to save the file he had an extra byte (the CR byte) per row that I didn't. Ten thousand rows produce ten thousand CRs, ten thousand extra bytes! Although I loaded Howard's file without problem (and he loaded mine) our different ini files made the saving operations different.

The ini file

If you send me a file that relies in any way on default option settings then send me a copy of your ini file too. If your file uses your default settings and if they are different from mine then all your defaults will be substituted by my defaults when I load your file. Perhaps the worst thing that happened to me because of this ini feature is that Colton Software sent me a price list on disc to send out with their PipeDream leaflet. Their default ini was for numbers to be to two decimal places; mine is zero. When I loaded their document and printed it, all prices were rounded to the nearest £1.00 (instead of the nearest 1p) and I didn't notice it! I use a default of zero decimal places; if I send you a price list in which I have forced some slots to two decimal places then, no matter what your default – even if it is ten decimal places – those slots I have changed from my default will be reproduced correctly (two decimal places) when you load the document into your machine.

File conversions

The Liberator (see last month's PipeLine column) was a now obsolete computer. David J Holden used to have one. He has written many file conversion routines to and from the Liberator format. One way of converting files from, say, MasterFile format to PipeDream format is to convert to and from some 'standard' intermediate format. David used the Liberator format as the 'standard' intermediate format. The good news is that David now has a copy of PipeDream 3 and will be rewriting his routines. He will probably use PipeDream as the 'standard' intermediate format.

Even better news is that Ian M H Williamson, a PipeLine subscriber, has volunteered to be a PipeLine Helper for all PipeLine subscribers who want to convert files of 'alien' format to PipeDream format. Send your files on a disc to me in the first instance and I will pass them on to Ian.

Illegal number of output bits

I can now make the definitive statement that this 'bug', which causes printing to be cancelled, is not a PipeDream bug. Of course I am quoting Colton Software but the experts over there have managed to get Acorn's !Draw to do the same thing under similar circumstances and have put the problem back to Acorn. Watch this space!

Patricia Vasey has written to me with a technique which helps her to avoid changing back to the default colours. It is simply to set the mode to a 256 colour mode (e.g. mode 15) from the palette icon. News such as this is still very much in demand both to help PipeDream users and to help diagnose the problem.

Here is the latest suggestion! If you have set your FontMax values such that you are using anti-aliased outlines on screen (with non standard background colours) then this is what is held in the Font cache. ColourTrans works hard for you on the screen presentation if you are using non standard colours. If you now send your document to a RISC-OS printer driver it seems to get confused about the anti-aliased outlines interpreted by ColourTrans and produces the error message. Well, if you don't understand what I'm talking about, don't worry, try Patricia's solution instead. What that (probably) does is to purge a lot of rubbish out of the Font cache so that the Font Manager stands a chance of sending correct information to the Printer driver.

Changing the colours in PipeDream to the default colours before printing doesn't always prevent the 'bug' striking particularly if you have a second application (e.g. !Draw or !Paint) with documents that contain text and a non standard palette. Here is some more advice; before printing from PipeDream clear any marked block with <Ctrl-Q>; if you can, purge the font cache (e.g. change the mode). It is always good practice to Save before printing; if you have extensive trouble with a file then save it, close the file, Tidy Up (or Quit) PipeDream, reload the file and then print it.

Printing sprites

There seems to be some confusion over a remark I made in March. On the July 1990 PipeLine disc there are 'workarounds' by Maurice Edmundson for printing sprites from within PipeDream in 'non square pixel' modes. The then current version of PipeDream would print sprites correctly only from within 'square pixel' modes. The latest version of PipeDream, V 3.14 will print sprites correctly from all modes. Because of this, the

'workarounds' on the July 1990 PipeLine disc are redundant. Indeed, if you use Maurice's 'workarounds' then V 3.14 will not print out the sprites correctly.

Hence, when I publish the 'revised edition' (in July 1991) of the July 1990 PipeLine disc I shall not be including the redundant 'workarounds'. Some people have said to me that they don't want to upgrade to V 3.14 because Maurice's 'workarounds' won't work any more with V 3.14. Don't worry about the 'workarounds' – upgrade now because V 3.14 is 'better' than earlier versions and you don't need the 'workarounds'. Gosh! Let's hope I've made it clear this time.

Upgrading PipeDream

This is a service for PipeLine subscribers only. I now have Colton Software's Upgrade Kit and permission to upgrade PipeLine subscriber's master discs to V 3.14. Send your master disc to me together with a label and a 22p stamp. I will upgrade your master and get it back to you by return post. A 'PipeLine subscriber' is one with a currently valid annual subscription.

Booting

I have had some correspondence with Elwyn Morris about difficulties he has had with booting up from switch on (PipeLine column August 1990). Some of the function keys were being executed after booting. This is cleared by adding a *FX 15 at the beginning of the Obey sequence. He was getting an unwanted Untitled1 file on screen at the end of the sequence. This doesn't happen if you include \FQlm as the last line of the Obey file called by !Boot.

DiscCat & ArcScan

Francis Aries has improved his DiscCat (disc cataloguing) program which first appeared about a year ago. He has used it to produce a catalogue of the PipeLine discs. One consequence of the improved program is that, to get the best out of it, Authors need to enter keywords on a specific line. I hope to issue the revised July 1990 disc with keywords in place for Francis' program. Please will authors of PipeLine articles write to me for details.

Let me know whether you want a catalogue of PipeLine in ArcScan format. I have had an offer from Joe Herzberg to look after the ArcScan format if there is enough demand so please let me know.

Has anybody got an index of the Archive PipeLine articles in PipeDream format including a column of keywords which can be searched?

Tax tables, bibliography and timetables

L H Snow has sent me a PipeDream tax table spreadsheet. Daniel Dorling's Bibliography and school/college timetables by Peter Wicks are both available on disc.

Mortgage calculations

Keith Matthews has sent me an excellent Shareware application which uses PipeDream to make mortgage calculations. Do you want a copy? Being Shareware you contribute to Keith whatever you think it is worth when you have tried it out.

Charles Dickens

This database is of characters appearing in the works of Charles Dickens. An excellent 65K file with references to over 1000 characters – this file is indispensable for crossword puzzle or Dickens addicts – by Roger M King of Guernsey.

Redefined keyboard

One for schools as well as serious users. Ed Rispin of the Institute of Terrestrial Ecology has sent me a keyboard definition macro which converts the keyboard to a set of tally counters. Ed says that when he has collected a sample of invertebrates then he has to count the different types. By allocating a different key to each type (e.g. Q for snails, W for slugs, E for earthworms, etc) then the count consists of tapping a single key for each specimen. Ed's disc contains the macro, a !Draw file for the keyboard layout and a blank for you to customise. Ed uses this for real!

Macros

A growth area for PipeDream users. Send me yours. Recent contributions include "Smart Quotes" and one to load and lock user dictionaries.

I am in contact with Colton about the best way of including macros on disc so that you can record a macro and then copy the macro to another disc (changing the directory path) and still have the macro 'work'. The problem is that different

people might have different directory or disc names for the directory containing the macros. I have a partial solution which involves the recipient of the disc of macro files clicking on an obey file to set a system variable which takes the value of the path name to the macros. Has anyone any other suggestions? What we need is a macro which sets the path to the macro directory!

The PUI

Up to now only two readers have written to Colton Software asking for more information about the PUI. Perhaps it is not going to be as useful as I and Colton Software thought!

Finally

At last I have managed to return every disc sent to me. Last month in desperation, I operated a last in first out (LIFO) system on top of a hierarchy of priorities. This meant that some of you who sent me discs had to wait quite a long time for a reply. Generally I have given the !Help correspondence a higher priority than PipeLine contributions. I think that the longest delay was about six weeks. Sorry! However, more of you benefitted from this policy than lost out and those with a problem usually received a reply by return post. Also the April 1991 PipeLine discs were posted early (during the last week of March). I am flattered by the spate of renewals – more than half of those who took the April 1991 disc have already renewed.

Please keep your letters and discs coming. I will do my best to keep you up to date with applications, to help you with your problems and I'll return your discs to you as soon as practicable. A

Language Column

David Wild

There has been very little new on the language front during the last couple of months – and it doesn't seem as though there is a great deal in the pipeline at the moment. I suppose that the next peak will be when object-oriented versions start to appear for the Archimedes as they are doing for the PC.

What does give some cause for concern, right across the computer range, is the standard of programs that get released. In some cases, notably dBase IV, the software house has been struggling to survive the damage to their reputation.

Recently, I found that I had been using my home accounts package for over a year and when I looked at the graphs I found that they didn't actually mean anything. During the first complete year they had reflected the state of my bank account quite faithfully, but the program couldn't cope with the change to more than one year's details.

An outlining package, supplied on one of the Careware disks from Archive, turns out to have a number of bugs in it. The instructions say that you are allowed eight levels of idea and you can "demote" an idea from one level to another. If you forget how far you have gone, the program can crash with an out-of-range subscript error. Another problem is that you can load an existing file into the program but it will still show up as a new file in the heading and using the save facility, which has a very useful default directory feature, will save it as a new file rather than the one that was brought in. There are one or two other minor faults which add to the spoiling of what should have been a very useful program.

The problem isn't, of course, confined to the Archimedes – or even to the micro-computer world. At work, we use a couple of mini computers with programs supplied by a software house to meet our requirements and we have to do some very fierce testing before we can let the programs into our "live" system.

The common feature is that the errors were not found at the testing stage; this ought to have eliminated all but the most subtle. It is true that testing can never prove that there are no bugs but a good testing plan can keep them to a minimum.

Ideally, this testing plan should be drawn up before any of the programming work is started. It is, in effect, an important part of the program specification. If you are writing a payroll program, for instance, somebody should know exactly what outputs *should* be generated by any input,

and if this isn't the case, you don't know enough to do the program design. The actual format, in terms of appearance, might well be left till later but the employees who are to be paid by the system will know how much they ought to get and will expect the program to do it correctly.

Equally, the Income Tax and National Insurance people will know what information, as well as money, they ought to get – and this will form another part of the specification.

In most other applications, there will be similar knowledge about what is expected from any input, and there should be clear information about what should happen to any unacceptable input. With this information, you should be able to generate test data which will allow you to check that all input is treated correctly.

Creating all this test data and documentation is a big and unexciting task but, if it is done properly, it can pay enormous dividends in keeping out many of the bugs which seem to infest many programs.

The test data doesn't all have to be realistic – invoices, for example, can be for silly small amounts – but each item of input should be identifiable throughout the run. One of my colleagues doing acceptance testing of a new program fell into a trap by creating several lines of data with identical amounts in each line. There was a bug in the program that only read the amounts from the first line and repeated them on all the subsequent lines for the transaction so he didn't spot the bug.

Languages such as the current versions of 'C' and Pascal, which allow you to compile separate modules to do common tasks, help to eliminate many of the bugs but you still need to test to prove that the expected results are produced.

The type of bug that I am talking about here must not be confused with design flaws. There are programs which don't do quite what I want but they do do what was specified – so there isn't a bug. A good example of this was a small database program given away with a recent issue of Archimedes World. The standard of programming, in terms of technique, is absolutely first class but the program still needs quite a bit of improvement. One interesting thing about it is that the programmer shows that reasonably complex programs *can* be written in BASIC without any need to use GOTO!

Turbo Pascal

I recently bought a copy of Turbo Pascal to run on the PC emulator. The object-oriented facilities are extremely interesting and I hope that someone, somewhere, is considering similar facilities for the Archimedes. The combined editor and compiler is useful; it has facilities for compiling in memory and any errors are reported back with the relevant source code.

Turbo Pascal "units" are very similar to the modules in Acorn Pascal and there are some very useful compiler options so that only changed modules are recompiled.

Another facility similar to that on Acorn Pascal is a construct known as a "typed constant" which is much the same as an initialised static variable. The pedant in me rather dislikes the name as I feel that a constant should be exactly that – with no risk of it changing during the run.

Another pedantic objection is that there seems to be no way of telling the system that you want non ISO-standard features flagged. The philosophy seems to be that because Turbo Pascal is so popular there is no need to worry about other people's standards. I do feel that this is rather short-sighted as many routines will be non-compatible.

As I explore the program, I will record my reactions and let you know how I get on in later issues. A

Credit where it is due

• **Thanks a lot!** – In Archive, 4.7, p 60, I asked for information about a module which makes the resolution of the mouse pointer dynamic.

The response has been quite staggering: I received no less than 23 letters from three countries telling me about the !MegaMouse module and as if this were not enough, 5 people actually sent a floppy containing the !MegaMouse.

Archimedes lovers really are great people!

Jochen Konietzko, Koeln, Germany A

Small Ads

• **A3000 + Acorn colour monitor** + stand. VGC £500 ono. Phone 0908–377239.

• **A3000 + colour monitor £600**. Chromalock 235 £145, Atelier £50, Render Bender £30, Splice & Tween £20, World View £5. All v.g.c. boxed. £800 the lot. Phone Mark on 081–670–8055.

• **A310 + CM8833 monitor** dual drives, 2 slot bp, Trackerball, Star LC10, 140 discs inc storage, many books. All vgc. £650. Failing eye sight forces sale. Can deliver up to 75 miles from E Northants. Phone 0933–57811.

• **A310/1** upgraded to 4M + 20M Hdisc £850, Oak 45M internal drive + podule £250, Armadillo A448M MIDI/stereo sampler £120, Acorn MIDI podule (latest software) £40, Laser Direct Qume £800, Impression II £100, Tracker £25, Armadeus £30, Splice £15, Investigator 2 £15. Cost of living forces return to Atari (yuk!). Phone Glenn on 0932–567614.

• **A310/1** upgraded to 4M, MEMC1a, IFEL 4slot bp, 2nd internal drive, VIDC enhancer. Ex. cond. £1050 o.v.n.o. Phone Len on 0225–428662 after 1 p.m. any day of the week.

• **A410, 2M RAM,** 40M hard disc, Taxan 775 multisync monitor, First Word Plus 2, all ex cond. £1000 o.n.o. Also Brother HR15 printer. Contact Mr Lefebure on 0869–50482 evenings.

• **A410/1 colour** 43M hdisk, 4M RAM, 5¼" I/F & ext drive, PC emulator, Acorn ISO C, ISO Pascal, PipeDream, FWPlus, PRM, Citizen 120D printer + lots of other software, books, mags discs etc £1800 o.n.o. House purchase forces reluctant sale. Phone 0380–720069 evenings & W/E.

• **A410/1** upgraded to 4M / 50M HD, Taxan 770+, dust-covers, manuals etc as new. £1800 o.n.o. Software available. Phone 0582–607690.

• **A540** as new, boxed, software, cables etc. Offers over £3000. Phone Len on 0225–428662 after 1 p.m. any day of the week.

• **Archimedes podules:** Acorn I/O, Armadillo A448 sound sampler & FFT, Brainsoft Multiboard. Also, Acorn C & Fortran 77. All under half price. (Also various BBC/Master stuff.) Phone Ronald Alpiar on 0202–575234.

• **CM8833 monitor** and lead £160 o.n.o. Phone 0942–884222.

• **Font Starter Pack** £20, Midnight Graphics Clip Art 1 £15, ALPS £10, World Class Leaderboard £10, Pacmania £5. Contact Michael Pargeter on 0462–434061 (evenings).

• **Original software** boxed with manuals Poster £50, FWPlus1 £30, EFF fonts (Albert, Clauch, Poster, Sophie, Sulikow, Swiss, Tamsin, Interact) £40. Phone Mike on 0742–342870.

• **R140 + Viking II** monitor + lots of PD software. Any reasonable price. Also Pipedream £120, Teletext adaptor (software versions 1.05 & 2.01) £70. Phone Andreas Fuchsberger on 0753–685048 or E-Mail andreasf@uk.ac.rhbnc.cs or andreasf@rhbnc.UUCP.

• **SCSI 20 Mbyte hard disc**, Miniscribe, formatted, tested. £90 o.n.o. Phone 081–643–1186.

• **Silver Reed EX43/IF40** daisywheel printer, 4 fonts, 5 cassettes, serial & parallel interfaces £150 o.n.o. Ring Bournemouth 529787.

• **Sony 3½"** drive & dual slot front panel £75, Viewstore (Archimedes) £15, WWisePlus (Arch.) £15, ANSI C v1.14 £10, 27128 EPROMs (PGM 12.5V) £2.75 each. All prices o.n.o. Phone 0234–856070.

• **View for Archimedes** £7.50, BBC BASIC Guide (vgc) £7.50. Phone Julyan Bristow on 021–427–5084.

• **Watford A310** 2M upgrade £150. Phone William Lack on 0743–790343.

• **Z88** + PC link II, 128k RAM, parallel interface, Archimedes lead, magazines £235. Phone Jason on 0533–704315.

• **Z88** with mains adaptor, Archimedes link, parallel printer cable, manuals etc £170. Phone Mike on 0742–342870.

Charity Sales – The following items are available for sale in aid of charity. PLEASE do not just send money – ring us on 0603–766592 to check if the items are still available. Thank you.

(If you have unwanted software or hardware for Archimedes computers, please send it in to the Archive office. If you have larger items where post would be expensive, just send us details of the item(s) and how the purchaser can get hold of them.)

User Guides £2 + £3 postage, Genesis 1 £20, Superior Golf £8, The Real McCoy (UIM, White Magic, Arcade Soccer & Quazer) £15, ArcWriter £4, Serial Interface/buffer for Epson FX80 £15. A

Schema – Good News & Bad News

David Scott

My recent acquisition of Schema (version 1.03) as a replacement for Logistix and its disappointing performance, has prompted me to set up a comparison between the three main contenders for the title of 'Definitive Archimedes Spreadsheet'. A list of the main good and bad points of Schema is also included.

Spreadsheet construction

A medium sized test sheet was created using each package in turn. It consists of 100 rows by 30 columns (3000 cells). Cell A1 was initially left blank. The rest of the first rows and columns were set up with expressions of the form 'A1+1' so that each cell depends on the value entered in A1. The block from B2 to the bottom right corner of the sheet (AD100) was set up to give the product of the current row and column using a formula of the form: '@A2*B@1'. (The @ sign indicates that the following value is fixed; the actual method for doing this varies on each package.)

Performance comparison

The performance was measured on an Archimedes 410/1 updated to 4 Mbytes of ram and using a 42 Mbyte hard disc for loading and saving. The system font was used for all tests which were displayed on a multisync monitor in mode 20. The results of the tests are as follows:

	Logistix	Pipedream	Schema
Load time	4 s	20 s	70 s
Save time	4 s	9 s	10 s
Recalculation time	4 s	13 s	90 s
File size	130 K	44 K	90 K
Memory size	c.700 K	800 K	832 K

Summary of results

Logistix is by far the fastest program. Its main disadvantages are that it is not a RISC-OS task and that the data files on disc are larger.

Pipedream makes most efficient use of disc space but is from 2 to 5 times slower than Logistix. It is a RISC-OS task but does not include graphs and charts.

Schema is slow for both load and recalculation although files are midway in size. Although many of the features are good, the performance generally is too slow when used with spreadsheets of a substantial size.

(I would say that judging spreadsheets on the basis of one example sheet could be a little misleading because different types of sheet will show off the strengths and weaknesses of the different spreadsheets. Ed.)

Features of Schema

How does the newcomer, Schema, rate in terms of performance?

Good features are:

- Full RISC-OS implementation
- Graphs and charts are available and may be transferred to other tasks in Draw format
- Comprehensive macro language allows complex task to be programmed

Poor features (see below for more details) are:

- Very slow with medium and large spreadsheets
- Memory control is poor resulting in large and increasing requirements
- Bugs can cause system failure and data loss
- Difficult to set up column and row widths quickly

- No headings facility for either columns or rows
- Bad choice of default style – not a commonly used format
- Macros can only be called by a slow menu-based method
- Printouts can have both missing and extra columns/rows
- Problems when loading data in CSV format
- No support for converting from Logistix (support is provided for Lotus 123)
- No standard database type functions as provided in most spreadsheets

Documentation is a 432 page manual which is comprehensive and generally has good content but is spoiled by some minor errors.

As mentioned in the March 1991 issue of Archive, a new release is likely later this year which will address some of the problem areas listed above. In the meantime, it is really only suitable for small spreadsheets where it compares well with the competition.

Now the bad news

Now for some detailed comments on some of the problems found with Schema Version 1.03. These are based on using it on an Archimedes 410/1 upgraded to 4 Mbyte of memory and a 42 Mbyte internal hard disc. The Schema application and all data files were installed in a dedicated directory on the hard disc. Schema was configured not to use overlays or reset slots.

Speed

The time taken to load and recalculate medium to large spreadsheets is slow. The larger the sheet, the worse this problem becomes. This effectively precludes the use of spreadsheets with more than about 5000 active cells since the load or recalculation times can become many minutes. The load speed is likely to be noticeably improved in future releases.

Window redraw

The time taken to redraw a spreadsheet window of fixed size seems to be proportional to the size of the spreadsheet. Large spreadsheets take longer to redraw even though the visible data area is just the same as for a small spreadsheet. This is because the results of visible cells can be dependent on other non-visible cells.

Work space

The amount of work space required seems to be out of all proportion to the size of the spreadsheet data file. One large sheet with about 10,000 cells required 2.4 Mbytes of memory during building of the sheet.

When workspace has been taken from the system, it can only be returned if Schema is quitted. Discarding all of the spreadsheets has no effect whatsoever on the current memory allocation. If a spreadsheet is saved, discarded and then reloaded, the memory requirement often increases further. If Schema is restarted, however, the memory requirement is usually much less than that previously required when constructing the sheet.

These work space problems will be improved in the next release.

Faults

When data is loaded from a CSV file, the spreadsheet must be created with sufficient rows and columns to accommodate all the data being loaded. If this is not done, all data which overflows the edges is lost without any warning.

If the default style is set to anything other than Plain before loading a CSV file then this is ignored and the default style is treated as Plain.

Setting column and row sizes

The Column Width and Row Height are tedious to set up from the menu as they are at the end of a long menu chain. One of these stages could be avoided by setting the default units required from, for example, the Spreadsheet Default menu. The values which are preset for the three different units are not equivalent (96 point is not 1 inch, the correct value is 72 point).

If one of the values is changed the values in the other units do not move in synchronism. The value in the dialogue box is always the default or last value set. It would be more helpful is this was the current value of the selected row or column as this would enable a new value to be guessed much more easily.

Note that the units required for the equivalent CHANGEHEIGHT and CHANGEWIDTH macros are pixels.

Using the mouse to change the width/height is not always predictable. Sometimes it seems to be impossible to make any change in size because, even though the correct mouse pointer appears, only a window redraw occurs. The amount of change in size is not always the amount indicated by the mouse pointer.

Dialogue box termination

When dialogue boxes are used, the program is not consistent as to the use of keys rather than mouse clicks to end the dialogue. 'Return' should always equate to 'OK' or 'Yes', and 'Escape' should equate to 'Cancel' or 'No'. In some cases, pressing <escape> allows the operation to go ahead instead of aborting it, for instance, with the block fill confirmation dialogue box. In this case pressing <return> has no effect.

Keyboard macros

Keyboard macros are rather tedious to use as they have to be attached to a submenu which is relatively slow to use.

Non-rectangular spreadsheets

If, as is quite common, it is not practical for a spreadsheet to be rectangular, all the cells required to make the spreadsheet rectangular are included by Schema if any formatting is applied to them. This can make the spreadsheet both larger in memory requirements and in the time taken to recalculate it. It is therefore worthwhile to avoid even setting a style to unused cells.

YESORNO Macro

If <escape> is pressed, the result is not predictable and may lead to system failure. It does not return <2> as stated in the manual, nor can the pointer be moved outside the dialogue box.

Plain style

It is not possible to alter this style permanently, as the default style reappears even after alteration and saving as the new default style. The default parameters chosen are not particularly useful as one decimal place is one of the less common requirements. The commonest requirements in my experience are for either integer format or for two decimal places (currency).

Headings

There is no headings facility which fixes one or more rows and/or columns on the screen. It can only be simulated by opening another window for the headings. This is both wasteful of screen space as well as tedious to set up.

Documentation Problems

Page 55, 156: the use of the symbols, ^ (raise to power symbol) and shift key symbol are confused.

Page 79: the three examples of rounding are all incorrect.

Page 83: the selected column width or row height is in inches, centimetres or points (NOT characters).

Page 228: the two local variables called 'a' and 'butter' are not declared in the example.

Page 233: Repeat evaluates the given sequence until the expression evaluates to a zero value (NOT non-zero).

Page 240: Line 2 refers to a list below. There is no obvious list.

Page 241: There is a reference to attaching a macro to F9 and F10. Both these keys are already used for other functions as is Shift F10.

Page 273: The 'Related macros' refers to CELL. This is a function not a macro.

Page 276: CONTMACRO refers to Shift F9 and F10. Shift F10 is already used. How is this specified, is it 0 = F9 and 1 = F10?

Print problems

If the grid lines are printed then their thickness is variable. The alignment of the characters relative to the grid lines is poor when the row height is reduced.

It is not clear that the 'Header' and 'Margin' figures represent fixed rows and columns rather than the row and column labels. When printed on the LaserDirect Qume, the contents of the Header and Margin rows and columns are not printed; only blank cells.

One more column at the right hand side of the sheet is printed than existed on the spreadsheet.

(Colin Ross Malone Ltd, who are doing the programming of Schema for Clares, have acknowledged most of these problems and are seeking to solve them and implement various enhancements in a later version(s) of Schema.) A

Impression is not

Well OK, that's not true. Although Impression has established itself as the most popular DTP program (and the most flexible) for the Archimedes, it may be surprising to learn that most owners use it day in, day out as their preferred word processor.

Impression was in fact designed from the start to be a word processor, by the company that developed Wordwise and Inter-Word, the most popular word processors on the BBC Micro. However Impression now uses the power and flexibility of the Archimedes to take word processing beyond what was possible on the original BBC Micro while losing nothing of the ease and simplicity of its predecessors.

" Easier to use than Wordwise " Well certainly no more difficult. For example to create and print a simple letter, even one many pages long, involves the following simple steps, (assuming a printer is set up and ready).

- Start Impression
- Click on icon for new document
- Click in window and type letter
- Press PRINT key followed by RETURN

There are no embedded commands to remember and it's not even necessary to use any menu options. If you want to use different text styles or justification options, these can be selected from the function keys (or menus). Selecting regions of text (for deleting, copying, moving etc) could not be easier than with the mouse, especially since we added such touches as automatic scrolling of the window when attempting to select beyond the visible window.

So not only do we feel Impression is easier to use than other word processors, it is also more powerful - not only can it handle more complex documents, it copes with much longer documents and provides unmatched control of the presentation and appearance of the finished document. By using the Acorn outline font system Impression offers complete control of type style and size - the type on screen exactly matches the final printed result.

One feature that sets Impression apart from other DTP programs is that it offers both the outline fonts system *and* a system-like font for simple 'character' mode or draft mode operation. This also means it can drive dot-matrix printers using their native built-in fonts for maximum speed. Of course using the RISC OS printer drivers in high quality mode means that whatever you do on screen, whatever fonts, size, position, style, graphics are used, they will be reproduced at the maximum resolution of the printer.

For the power user (that is someone who produces documents of any type on a regular or professional basis) Impression II provides the necessary features (frames, styles, master pages, embedded graphics, unlimited length documents, contents and index generation etc).

$$J_n(x) = \frac{x^n}{2^n n!} \sum_{s=0}^{\infty} \frac{1}{s!(n+1)^s} \left(-\frac{1}{4}x^2\right)^s$$

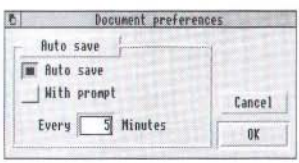
Version 2.1 is now available. It includes automatic timed save, crop- mark printing, vertical rules for things like tables and sidebars, and other new features. Contact Computer Concepts for upgrade details.

New!

When used with our highly acclaimed Equasor equation generator program (£49+VAT) Impression is the ideal tool for producing technical or mathematical documents.

In order to highlight particular sections of text Impression 2.1 allows sidebars, such as the one used here, to be set as part of the style. The vertical position, thickness and colour can all be controlled from the style editor.

But rather than the more obvious and powerful features, it's the subtle and often overlooked aspects of Impression that make it a delight to use - its speed of operation; the fact that most dialogues can stay on screen while you continue to edit; the care and attention paid to the visual side of the program. Even though the program is now more than a year old it con-



Impression 2.1 can automatically save your document every 'n' minutes, with options to do this with or without prompting.

a DTP program !

tinues to receive glowing reviews. To quote Paul Beverley, editor of Archive magazine. *"Thanks to Impression (which I am more and more impressed with every day) I have managed to shorten the time taken to produce the magazine quite considerably."*

Although Impression is a word processor, what other word processor, or for that matter DTP program, is able to produce results like this advert.

Impression 2.1 . . . . . £169.00 +VAT (£198.57)

Impression Junior . . . £89.95 +VAT (£105.69)

Beyond other WP's

Impression and Impression Junior offer many features beyond those normally found on Archimedes word processors. Here are just a few:

- **Format as you type - no reformat key or menu**
- **Outline fonts, any size, any typestyle, any position on the page**
- **Multi-column work**
- **Text automatically flows around graphics**
- **Full graphics capabilities**
- **Embedded graphics (flows with the text)***
- **Simple, intuitive editing with a wide range of key short-cuts**
- **Retroactive styles and master pages***
- **Fine typographic control - kerning, text size, line & paragraph spacing etc to a 72,000 dpi resolution***
- **Rules for sidebars, rule-offs, tables***
- **Huge range of print options**
- **Multi-line headers/footers even with graphics**
- **Draft 'character' mode printing or RISC OS printing**
- **Full colour control**
- **Includes enhanced version of SpellMaster, the popular BBC spelling and typing checker**

*Not all of these features are available on Impression Junior

Impression business supplement

This optional extension pack provides a range of new features for the professional or business user. It includes:

- A new range of file loaders for Microsoft Word (RTF), Word Perfect, Wordstar and Pipedream 3 allowing files from these word processors to be dropped directly onto Impression frames.
- Our ExpressionPS utility for typesetting documents. Greatly simplifies the process of producing PostScript files suitable for typesetting. Automatically substitutes PostScript font names, allows screen angles and screen density to be set.
- Full (four) colour separations. So now at last Archimedes owners can output four colour PostScript separations from any Impression document. Essential for anyone producing high quality colour leaflets or adverts. This offers advanced features such as under-colour removal and Adobe recommended screen angles.
- Mail merge program and record sorter utility. Allows simple multi-field records to be seamlessly merged into Impression documents.

£49 +VAT (£57.57 inc)

Computer Concepts Ltd

Gaddesden Place, Hemel Hempstead, Herts, HP2 6EX Tel 0442 63933 Fax 0442 231632

Stars on your Screens

Ronald Alpiar

(Some time ago, we asked readers to tell us what sorts of things they did with their Archimedes computers. Ronald has written to tell us about how he uses his Archimedes (alongside a PC – Hiss, boo!) to do some fascinating computer assisted astronomy. We have given him some space – perhaps more than usual, but it is very interesting – to explain. He has sent some photos to show us but not all of them, I am afraid, are easily reproducable in mono, but we will have a go with some of them. Ed.)

The computerisation of astronomy, 're-rigeur' for the professional astronomers, is now all the rage amongst amateurs. So I ought really to begin with a Pauline Health Warning and caution you that, once hooked by this metamorphosis of an ancient hobby, you may well become a lifetime addict!

Here's how it all works. At the focus (both literally and metaphorically) of the entire setup is the Charge Coupled Device Sensor – the CCD chip. This is an IC somewhat similar, electronically, to an EPROM, in which the UV filter is replaced by a transparent glass window. The light sensitive area consists of an array of pixels in each of which incoming light photons can be converted into 'free' electrons. They are not quite free, because each pixel forms a potential well which confines the accumulating photo-electrons. At a given signal, the potential well walls are lowered, thus shepherding packages of pixel electrons in an orderly manner to a readout position where each such package creates a charge for amplification, receives further processing and finally is turned into a video display. In normal circumstances this 'expose-readout' cycle takes place at video frame rate – 50 frames/second.

Now, what can you see if you point a normal video camera at a starry sky? The answer, however light sensitive your camera may be, is precious little – far less, in fact, than you'd see with a cheap pair of binoculars. At best, a few of the brightest stars visible to the naked eye – big deal!

So what's the point? The point lies in that tiny time slice – 1/50 second – during which photo-electrons are allowed to accumulate in the CCD's pixels – that is under normal video operating conditions. The intelligent reader will now be way ahead of me. Why not permit the pixels plenty of time to amass lots of lovely electrons and only then flush the accumulated contents to the readout position? This 'integrated exposure' is precisely the trick which astronomers use to capture the images of faint stars – whereby not 1/50 sec, but seconds, minutes or even hours of integration time are employed. The method works splendidly – but there are three snags.

House Full!

The first snag is that the potential well walls which confine electrons within pixels are necessarily finite. In practice, about 150,000 electrons would fill up a well; adding more would cause an overflow to neighbouring pixels. So, if in order to capture faint stars, you increase integration time, any bright stars in the field will be over-exposed. Any further photo electrons created will slide over the top of the potential walls into neighbouring pixels. Ultimately the entire pixel array can become flooded by the overflow from brighter stars. However, long before that catastrophic point, both detail and dynamic range begin to suffer.

Keep it cool!

The second snag is that, even in the total absence of incoming light, we have to contend with free electrons in the CCD substrate. Being confined in potential wells, these 'thermal electrons' build up – just like photo-electrons. The term 'thermal' is well chosen, since this phenomenon is highly temperature dependent. At normal room temperature, and even in the total absence of any incident light whatsoever, thermal electrons can fill up potential wells in as little as 10 seconds. How then do the professionals achieve integration times of minutes or hours?

The answer it to cool it! By reducing the CCD's temperature, and hence that of its substrate, you

dramatically reduce the number of thermal electrons – thus opening the door to long integration times. Nowadays cooling is delightfully simple, thanks to a tiny device known as a Thermo Electric Cooler – TEC. It consists of a parallel array of diodes which utilise the Peltier Effect to act as a heat pump. Heatsink one end of the pump, and the other end rapidly cools down. In practice, a TEC is a tiny sliver – size of a 5p piece – which is thermally sandwiched between the under surface of the CCD chip and a substantial heatsink. It is typically powered by a 5 volt ¼ amp DC supply and quickly lowers the substrate temperature at least 30 C below ambient. At that stage, we stop worrying about thermal electrons and start worrying about our optics getting covered with condensation!

Grab it!

Now, video signals normally consist of a train of successive frames flying past at 50 frames/second – the eye and photo-persistence providing the illusion of continuity. Our third snag is that following integration time we receive one frame and one frame only of integrated information. High alertness is needed to grab it before it is gone for ever. One way to do this is to record it on video and subsequently view the single integrated frame in freeze-frame mode. However, this solution is far from satisfactory for critical astronomy. Rather, the frame is digitised, pixel-by-pixel, the results being stored in RAM. We thus end up with an area of RAM which mirrors the contents, after integration, of the array of CCD pixels. Timing is of the essence; grabbing the next frame must follow immediately after sending the 'stop integrating' signal to the CCD driver: and that can only be done when the same device controls both integration and the digitiser board.

Image processing

This is where the computer takes over. After generating a timed exposure and grabbing the integrated frame, displaying the result on VDU could simply consist of transferring the appropriate contents of RAM to screen.

However, we can do far, far more than that. Image Processing (IP) enables us to manipulate, clean-up, enhance, even beautify the raw image – beyond photography's wildest dreams. At its simplest level, IP is used to scale and/or rotate the display – maybe for easier comparison with star charts. The two commonest IP functions are 'thresholding' (removing noise by setting a lower intensity limit to what's displayed) and 'stretching' (selecting part of the observed dynamic range and scaling it to cover the entire dynamic range available on display). These two simple, but powerful, techniques reveal faint details which are practically invisible in the original image field. 'Convolution kernels' can be applied to detect edges and thus sharpen up fuzzy images. At a more advanced level, FFTs are used to compute spacial frequencies, thus enabling us to resolve nearby sources – such as binary stars which are so close as to appear as one. Lastly, by in-depth analysis of the image field, a novel method of IP (developed by the author) – called 'auditing' – allows us to tabulate the entire stellar contents for display in any way we choose.

Nor is there any colour-bar, even though we're using monochrome cameras. Information obtained by conducting timed exposures via coloured filters can be combined to display the subtle tint differences between stars – or indeed to enhance them.

I don't have to remind my fellow countrymen how hostile our climate is to astronomy. Sometimes ages pass with barely an half-hour break in the night sky coverage. This makes computerised astronomy particularly attractive: during a single half-hour cloud break, you can capture enough images to keep yourself happily occupied processing, studying and wondering at them for weeks to come. Moreover you need burn no midnight oil!

Getting it together

We've now considered all five essential ingredients – CCD sensors, integrated exposure, cooling, frame grabbing and image processing. How is this kit of parts all put together? Back to that bedroom – which happens to adjoin a large flat roof – home to the author's astro equipment including the item of concern to us now, illustrated in the photo. Here we see an array of three cameras saddled on a common 'equatorial' mount. Before

turning our attention to those cameras, a few words about the mounting.

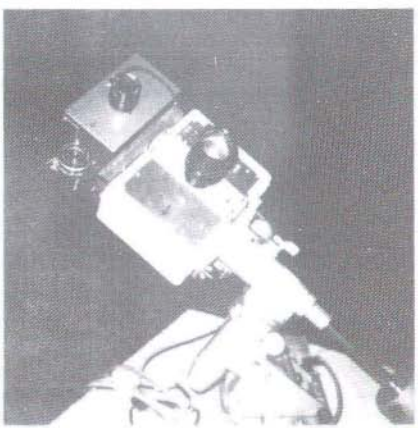
As is standard in astronomy, it consists basically of two perpendicular axes, so that one can point the camera array in any direction. However, the whole thing is strangely tilted over. In fact, one of the axes is adjusted to always point directly at the earth's celestial pole – the Pole Star near enough. This is because, due to the earth's daily rotation about its own axis, all stars (Sun included) appear to trace out concentric circles, centred on the celestial pole – circling it in approximately 24 hours. When we make timed exposures we would just see faint circular arcs instead of sharp star points. So we have to compensate for the earth's rotation by counter-turning our cameras about the same axis, and at just the same rate. Astronomers call this 'tracking' : if the mount is equatorial this is very simply achieved by inching only one of the mount's two axes of rotation. In my case the axes are driven, via precision worm gears, by three stepper motors. A BBC Master is dedicated to complete control of the equatorial mount. Its User Port generates TTL signals which, after amplification, drive the stepper motor windings. Software enables one to slew rapidly from 'home' direction to any chosen direction in the sky – or to any object whose celestial coordinates are known: calculating the correct number of stepper motor steps, the program compensates for the fact that the star will have moved on or back a little by arrival time. On completion of slew, the mount locks onto the direction by tracking: again the program uses internal timers to generate stepper motor pulses at exactly the correct rate to compensate for the earth's rotation.

Cabling trunks connect the roof-top equipment to the bedroom computer control centre. Thereby all slewing, tracking, camera operation, shutter control, focussing, viewing etc can be remotely performed in the luxury of indoor warmth and comfort.

Cameras and lenses

There are three independent cameras in the array. Two of them are DIY modified Phillips Imaging Modules. These consist of a CCD sensor together with all the electronics to drive it on five surface technology circuit boards. All it needs is a 12 volt supply, and an ordinary video monitor to display the view. I had to locate and cut the fine circuit board tracks which send four sets of timing pulses to the CCD. They are diverted to an extra board which subjects all four to a common TTL gate control. When control is low, CCD operation proceeds at the normal video rate: when high, the timing pulses are interrupted, allowing photo-electrons to accumulate until it falls low again. Nerves of steel and rock steady hands were needed to cut and solder the microscopic tracks on the surface technology circuit boards! Only one of these two cameras incorporates a TEC cooler. The third camera, which provides all the illustrations for this article, is a commercial Lynxx astro camera from SpectraSource.

The photo shows all three *(if it comes out in print! Ed)*. The rectangular boxes house my modified Phillips Imagers. The lower, and larger box contains the TEC cooled imager, its reddish copper plate heatsink being clearly visible. Nestling and somewhat dwarfed between them, sits the Lynxx camera.



Notice that all three employ, as optics, ordinary camera lenses. Although all have also been mounted on powerful astronomical telescopes for deep sky work, the humble photo lens is all that's required for wide 'rich field' working, comet hunting etc.

Digitisers

A digitising circuit is essential to convert the analogue pixel charges to digits for computer storage. The digitiser has to be very fast, particularly if its to grab and digitise pixel contents at full video rate. Assuming a 256x256 pixel array, each digitisation must be complete in a mere 0.3 μsec: this can only be achieved using so-called 'flash' converters. However, if the readout can be slowed down to a more leisurely pace, we gain time to digitise with greater accuracy. This leads to another important digitiser requirement – resolution: that is, the number of bits that an analogue variable is digitised to. It can easily be shown that high resolution – lots of bits – is quite critical for serious astrophotography: otherwise not only do we sacrifice the vast dynamic range of stellar brightnesses, but fainter stars, close to the noise background, are progressively lost. Professional astronomers use 16-bit (or more) digitisers: but plenty of serious work can be done with 12-bit resolution. Eight bits is just about tolerable for amateur work; whilst with only 6 bits, one's options become quickly exhausted.

Here's what's available –

For the Archimedes: Watford's Video Digitiser (6-bit) Hawk's V9 Digitiser (8-bit)

For PCs : Lynxx Camera & Digitiser (12-bit) & very many other 8 bit ones.

I use the Lynxx digitiser plugged into a PC, and a Watford Podule on the Archimedes (Hawk being too expensive though desirable). Surely a slight modification of the Watford Podule, incorporating one of the increasingly cheap and common 8-bit flash AD converters would be possible – thereby transforming a clever toy into a valuable piece of scientific equipment: Mike, are you reading this?

Computers

Digitisers are designed to plug into specific computers: so the demands of the digitiser dictates the choice of computer. There's absolutely no way one can treat a Lynxx digitiser as an Archimedes Podule – nor a Watford Podule as a PC expansion board. So to use the Lynxx camera at all, one needs a PC – in my case an Amstrad 2286. Lest I be accused of treachery I plead that the latter is used for only two purposes, both unprovided for by Archimedes, namely as host to (a) the Lynxx expansion board and (b) a CD-ROM reader expansion board. This latter gives me access to the gigantic (19 million star) GSC catalogue on two CD-ROM disks.

In both cases, files of information are written onto disk, and immediately transferred to Archimedes (thanks for Arxe's MultiFS software), where all remaining work is carried out.

IP software

All imaging processing and display software is written in BASIC, with some embedded assembly language. My highly CPU intensive and recursive Auditing algorithms are also in BASIC and greatly accelerated using the ABC Compiler. 'C' afficionadoes may raise their eyebrows – but I offer no apology! After nearly 2 decades of intensive programming in both languages I find BASIC incomparably the better for developing, testing and running. It is fully up to coping with the most elaborate algorithms, including compilers for other high level languages. The ability to run in either interpreted or compiled modes is a godsend, which decimates development time. I might expatiate for hours on C's many and grievous shortcomings: here I mention only its messy and confusing insistence on a cacophony of curious brackets and punctuation marks and the quite appalling implementations (with the honourable exception of Borland's Turbo C) which force the hapless programmer to spend far more time struggling with a user-hostile implementation than actually writing the program! To me C appears to be advocated on grounds which are either doctrinaire (e.g. that it's 'structured') or quite false (e.g. that it's 'portable'). *(I was going to edit this out to avoid possible offence but... well, it's a magazine in which people can express their own views, so, why not? Ed.)*

The accompanying figures (all of which are dramatically illustrate the power of IP. They are all based on a single exposure using an Olympus 42mm f1.2 lens and a 30 second integration time. Of all the stars shown (some 120 have been audited) only the brightest would be visible to the naked eye.

Figure 1 is the raw CCD image. Theoretically, individual stars ought to occupy only 1 pixel. Note that the brighter ones already overflow into neighbouring pixels. Moreover, the brightest, top right, shows the typical tail due to its electrons being dragged over neighbouring pixels, when flushed upwards to the readout position. Software added the coordinate axes and labelling, the sky itself being devoid of such. The stars are plotted on a 16-level grey scale, which scarcely does them justice.

In Figure 2 we see the mixed benefits of windowing and stretching. Many more stars are seen than in the original, however they've all grown into quite ugly blobs, as in a badly focussed picture.

The pristine point nature of stars is restored in Figure 3 *(only on program disc)*, thanks to the Audit processing. Lastly, in 4, we see the effect of adding colour *(definitely only on the program disc!)*. Information extracted from three extra exposures, using red green and blue filters was added to the original naked exposure. The hue information was mathematically scaled up to exaggerate the slight tint variations amongst the stars. A

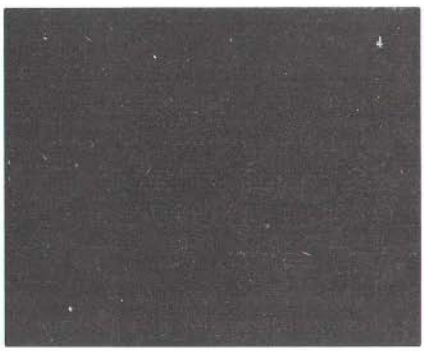


Figure 1 – The raw CCD image

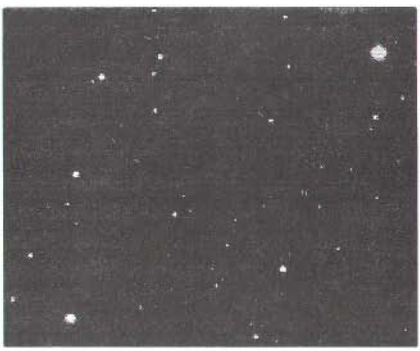


Figure 2 – The effect of windowing and stretching

DTP Seeds

Tony Colombat

Open any magazine with connections to the Archimedes and somewhere there will be a reference to DTP. It may be a comment on one of the many programs, details on DTP history or terminology, or just hints and tips on how to avoid such errors as "rivers" or "orphans". I find all this detail interesting but does it improve my DTP?

Inspiration for DTP

It is with the aim of providing inspiration for improving DTP presentation that Mike Matson's book has been produced. The 120 pages are packed full of ideas, designs and creativity which the reader is encouraged to adapt for their own purpose. The biggest idea which is passed on in the book is the need to look carefully at what you read – not just at the words but at the way the words are presented and how this may help you in your own productions.

Contents

The headings include; Page layouts, Stationery, Graphs, Invitations, Posters and Advertisements, Contents, Headers and Footers, and Titles and Logos. Each section contains a number of examples, some of which are annotated to describe features the reader should observe. To fully appreciate the techniques involved, however, a supplementary disc needs to be available. This should be possible, as incredibly, all the pages of the book were produced using "Edit", "Draw" and (showing its power in DTP) "Poster" from 4Mation.

Conclusion

Is the book worth the money? It certainly is if you want inspiration for producing impressive DTP documents, but don't expect to learn any technical terms or details. I think the book needs to read in conjunction with simple technical reviews such as that supplied in Archive 4.3 p51 or the book supplied by Computer Concepts along with their Impression II DTP package.

"DTP Seeds" by Mike Matson from 4Mation at £8.45 (or £8 from Archive). A

Shareware Nº 37

Alan Highet

All the programs have been tested on a standard A310 and on a 4 Mbyte A410 with ARM3 and SCSI hard drive. Unless otherwise stated, all programs ran on both machines.

Help

This is a very clever utility which adds a help option to the filer application menu and is resident in most of the applications on all the discs I have received from N.C.S. recently.

If you click <menu> over an application and then go to the sub-menu 'App. <application>' there is a help option added which, when selected, displays the readme file in the application directory. It works by having a 'Help' application inside the main application which in its turn displays the readme file.

Aidon

If you click <menu> on the disc icon and select 'Free', a rather messy command window appears showing disc space in bytes which most people find confusing. This utility changes that by intercepting the call and displaying the information in a neat little window with the space displayed in K along with a sliding bar displaying graphically the amount of disc space used.

Basedit

This is yet another icon bar front end for the BASIC editor but this one really does set out to allow you easy access. You can just <shift-click> on a BASIC program and the editor will be loaded with the program in view. Returning to the desktop by pressing <F1> twice leaves the program but unfortunately doesn't warn you to save the program. The other problem is it will not work with a SCSI hard disc. I assume because it's looking for ADFS disc 4.

This is certainly one of the best front ends I've tried and, with a small modification, I would use it regularly.

Find

Clicking on this icon displays a find box enabling you to search any disc for a file or directory with the ability to use wildcards and filetype selection. Clicking on 'Go' starts the search and, as the files are found, they appear below the main window. When the search is finished you may click on any file displayed and the parent directory will appear. – A very useful addition for anybody with a hard disc. *(I find it awfully slow by comparison with the equivalent on the Mac. Is there a faster version or is it a function of the way the Archimedes files are structured? Ed.)*

Myhelp

This allows you to add your own help commands which can be called up at any time. You simply add the command to an ASCII menu and the help lines to another ASCII file and then place the application on your disc. Clicking on the application displays a window with the relevant command queries and clicking on the required one displays the associated information.

Pseudoapp

This application is only really useful for a hard disc owner as it allows multiple applications to be seen but only one copy to be kept on the disc so saving space. After installing it on the icon bar, you drag an application to the bar and release it. A similar application icon will appear and this can then be dragged to a file window and released. The program then creates an application which contains only a !Boot file, a !Sprite file and a !Run file which stores the location of the real

application. By double clicking on the icon the real file is then run transparently to the user.

This has a limited use but works very well and could be used for temporary directories for program development. Although this works just as well on floppy discs, prompting you to insert the appropriate discs, you might as well label the discs properly and install the actual application.

Setdir

Once this is installed on the icon bar, any directory dragged to it is selected as the current directory and a filer window is opened displaying the contents of that directory. There is also an overscan utility selected by clicking menu on the icon bar. This gives you an overscan version of most of the popular modes along with a very big screen and a very small screen.

The setdir side of the application works fine but the overscan did cause me some problems. If you are using overscan and you quit overscan instead of selecting a new mode with the palette icon, the machine will lock up requiring a <ctrl-break>. Although this is not really a bug, I do think you shouldn't be able to do it.

StrongEd

This is a text editor similar to Edit but allowing up to four documents in memory which you can cut and paste between. Although quite useful, it really is only the same as multiple copies of Edit. The program sits on the icon bar and is RISC-OS compatible but does not multi-task. Programs may be loaded by dropping onto the icon bar and saving is either achieved by a normal save function or, if creating a new file or filetype, returns you cleanly to the desktop with a save box ready to drag to a filer window.

The functions, similar to Edit, work very well and the speed of the search and scroll are truly superb but I just wonder what benefits this program has over Edit or Twin. Maybe time will tell?

Fontmenu

This module provides a hierarchal font menu which means that the initial menu shows the font name with sub-menus showing styles such as bold, italic, etc. This is very similar to the menu used in Impression II and is a much tidier idea for anyone using more than a few fonts. The problem is that you need to understand something about programming to use it and if you wish to use it with commercial software you would need to be able to access their code which is not at all easy if the program was not written in BASIC.

Hdrivelist

This is an ASCII list of virtually every hard disc drive giving details such as size, access times, track data and other technical details. The list is very comprehensive but I wonder if anybody would actually use it?

Interface

This module allows you to add graphical effects to your windows when writing an application. One nice touch was the inclusion of an Impression document for the manual as well as an ordinary ASCII file.

The effects available at the moment include a choice of borders for an icon and the choice of how the icon is displayed when selected. You can also select the type of pointer used depending on its position, similar to Impression.

My programming knowledge doesn't allow me to fully utilise this module but what I have seen works well and compliments the already easy to use FormEd which is also included on the disc.

Sysfont

This allows you to create a module to change your system font by typing *ALPHABET <alphabet name>. Any BBC font can be used (filetype &FF7) and nine are provided with the program.

This works perfectly and could very easily be incorporated in your own programs to change text as and when required although the desktop font can just be installed by double-clicking on the appropriate icon.

Zansi

Zansi.sys is a replacement for Ansi.sys in MS-DOS and increases the screen response under PC emulation. I have not been able to test the program but the author claims that the Archimedes will run faster than an 8MHz AT. Also included are MORE.com which replaces the DOS 'type' command and VIEW.com which allows you to view files just like a text editor. A

Creating the Right Impression

Ivor Humphreys

As Audio Editor of the monthly classical record magazine GRAMOPHONE, I look after all aspects of the pages which are devoted to hi-fi matters. Until recently, the whole of the magazine has been produced the hard way, using glue and scissors to assemble pages which the printer then follows. An Archimedes user since 1988, it was inevitable that I should look towards its DTP potential, with a view ultimately to producing finished pages for the magazine. With that in mind, I made contact with Computer Concepts in August 1989.

Progress has been methodical and, I'm glad to say, almost linear. There was much to learn about driving Impression well enough to produce final artwork which would emulate our house style exactly, although the program is wonderfully intuitive to use. I was determined not to compromise in any respect, and things like the symbols we use to denote the CD, LP or cassette media (◌ ⊙ ▭), the extended range of foreign accents we require and the way in which in-text codes for all these things are used in our 'raw' copy (much of which comes across from a PC network running Wordstar) naturally took some fathoming. I must say straight away that we could not have been achieved all this without the frequent and extensive help we have received from CC, who have written a special version of their Wordstar loader module to suit our particular requirements and have also helped iron out several last-minute crises that we have had with PostScript.

The system has been in regular use for magazine work for about a year and now supplies finished artwork for the whole of our audio section, several other fairly complex editorial pages, some advertisements and quite a lot of other in-house material each month. It also generates about a dozen preliminary pages of our twice-yearly catalogue of classical music releases as well as its monthly supplement. We are about to embark on the most ambitious project of all, so far: the 1992 edition of our 672-page book for newcomers to Compact Disc called *The Good CD Guide*.

As an Archive subscriber from the start, I naturally corresponded with Paul Beverley on occasions and indeed NCS have supplied two of our three machines. As Paul has had a fair number of enquiries about producing professional artwork on the Archimedes, I volunteered to jot down a few thoughts to try and smooth the way a little for others wanting to produce professional DTP output.

PostScript

To produce finished artwork, you will have to convert your DTP program output to PostScript format on a disc which can then be taken to a professional typesetting bureaux. As only a very few of these have so far installed Archimedes *(but for details of some that have, see Impression Hints & Tips, page 11. Ed.)*, the final format will almost certainly have to be MS-DOS, which is universally accepted. The Acorn PostScript printer driver is used to produce the file, which is then dragged across to an MS-DOS filer window and renamed. At GRAMOPHONE we use a separate directory on the hard disc (called, quite sensibly, 'PostScript'!) and use the same default name each time to prevent the build-up of redundant material; this is well worth the trouble since PostScript files are often large.

System requirements

Much of my early work was done at home on an A310 with no hard disc but with an external Cumana 40/80 track 5¼ inch drive which was used with the PC Emulator and for taking Beeb-originated text from one of my colleagues. An early 420 at the office was a revelation and this, as well as the 310, has now been upgraded to 4 Mbytes of RAM with ARM3, to complement the recent further acquisition of an A540. I think now that a RAM capacity of 4 Mbytes is pretty well mandatory for serious DTP work (8 M isn't outrageous), as is a hard disc, and I would describe ARM3 as one of those rather expensive options that makes you wonder how you managed previously.

Two excellent utilities are Minerva's PC-Access and, for the Beeb files, Emmet Spier's Public

Domain program DFSreader. PCDir (also PD) is a perfectly good alternative to PC-Access except that it doesn't format discs to MS-DOS, something which is a surprisingly regular necessity with the size of typical PostScript files. (Loading the emulator just to do this is a pain because it doesn't multi-task.) A couple of other utilities I've found particularly useful are Wastebin from LOOKsystems, which has the benefit of saving its 'rubbish' to disc (giving you a second chance to rifle through it, unlike the regular filer delete option) and Emmet Spier's SciCalc, which I use a lot in almost every session (you can even drag results into an Impression document). Both of these are also PD and available from NCS. One final plug is for Jonathan Marten's latest enhancement to the original !Draw program, DrawPlus, which, like Impression, is extremely intuitive to use. I find it invaluable. Again it's PD but I would have paid good money for it.

(DFSReader is on Shareware 31 (or as a separate program from Watford Electronics at £6 + £2 p&p + VAT), PCDir is on Careware 7, Draw1½ (an earlier version than DrawPlus) is on Shareware 34 and DrawPlus is on Careware 13. There are dustbins littered(!) around various Careware and Shareware discs, but the LOOKsystems' one is on Shareware 36. Ed.)

Output

The latest version of Impression II (2.10) has the facility to add crop marks at the printing stage, obviating the need to set up a master page which is larger than the final required page size. One anomaly with the Acorn PostScript driver, however, is its inability to print pages larger than A4, regardless of the page size set in its menu options. All professional work requires either crop marks or, for four-colour work, registration marks outside the document print area. There are two ways around this. The best by far is to purchase CC's Expression-PS utility, which has a variety of very useful functions designed to enhance the existing Acorn driver. (These include a range of standard pages with or without extra margins for crop marks, control of half-tone screen density, dot shape and screen angle and an extremely 'friendly' routine for matching up PostScript font names with their Acorn equivalents.) Alternatively, one can modify the "PrData" file for one of the set pages within the driver application itself. For example, my page width is 230mm and the depth 300mm, which equates to 652pt by 850pt. I use Version 1 of the driver, in which the A4 page is altered, changing the line:

```
page_selection: %%BeginFeature:
      PageSize A4|Ja4|J%%EndFeature
```

to read:

```
page_selection: %%BeginFeature:
      PageSize A4|Jstatusdict begin
          652 850 0 1 setpageparams
              end|J%%EndFeature.
```

This modification will also be of help to users with limited RAM space, since to install Expression-PS requires 96k. (If space is really tight, another 96k can be retrieved by Quit-ing the printer driver after installation, since only its module is required once set up.) If your PostScript driver is Version 2, you should edit its text file PrDataSrc in a similar manner and then run the program PrSquasher to generate a compressed version of the data file PrData. Unless you are using ExpressionPS, you must add the relevant Acorn–PostScript font translations to the end of the PSprolog file for any additional fonts that you buy. You should also add the PostScript names to the commented (%%) list at the top of the same file.

The bureau will either use the MS-DOS Copy command on a PC (or compatible) to send the file to the phototypesetter via the serial port, or via a Macintosh using Apple File Exchange or DOSMounter. They will need to be told that your files are PostScript and it will also help them to know how many pages there are and what sort of size the files are; any graphics in a file greatly increases its size and thus takes longer to transfer at typically 2400 baud. PostScript files can be truly massive: 100K or more for a complex A4 magazine page with quite simple graphics is not uncommon. You need to decide whether you want bromide or film and, if the latter, whether you want positive or negative output (this option can also be set with Expression-PS). Typical current prices for an A4 page are £3·50 for bromide for next day completion (£5·30 same

day) and £6·50 (or £9·50) for film. We use bromides at a medium resolution of 1,270 dpi for most of our work and to be frank there is little point in going higher for most purposes.

One tip to finish with. Generally, I have found it safest to break long documents down into smaller units. With the fairly complex layouts used in a magazine, it can even make sense to print each page separately so that if a fatal PostScript error is thrown up at the bureau, you can at least go back and focus on the guilty page. This may seem fiddly but the cost can quickly mount up with repeat trials and anyway the bureau cannot afford to be tied up with endless experiments. On the other hand, they will be happiest, once you've gained confidence, to have the files in slightly larger chunks of between, say, 5–15 pages, depending on the project. A

Careware Disc Nº 4

Tristan Cooper

Careware Disc No. 4 is another excellent compilation of Public Domain software, providing a combination of applications, demonstrations, utilities, games and other entertainment. There is comprehensive documentation on the disc which will help you get the most benefit from these programs. The memory required by each application is shown after the name, below.

!Bin (16K) – This is a RISC-OS dustbin to run on the Archimedes desktop. As it provides instant file deletion, rather than storing files away for later removal, it is a good choice for floppy disc users. If you want to delete a directory, however, you must Select All the files in it then drag them to the bin.

!Projector (488K) – This animation must be run in mode 15 in order to give the correct speed and the right colours. The author, Malcolm Banthorpe, gives us a wide screen projection of three, essentially blue, birds that gently swan around their window. The action is smooth and impressive and shows what can be done using a combination of Euclid and Mogul. Although acting as a background task, a 1 Mbyte machine is not going to have much left for anything else.

!SeriaLink (200K+) – This utility is for those who wish to transfer files from Archimedes to BBC. The documentation is clear and explicit. Note that a cable will be required to connect the machines via their RS423 ports.

!Sparkplug – is provided to expand some archived files.

!Invade (32K) – If you need any distraction from your various desktop tasks, this pretty little space invader will cruise back and forth above the Icon bar. Zap with the mouse at your peril!

!Pelmanism (24K) – This old, old favourite card game surfaces in desktop form. As you might expect, you have to match pairs of cards together – but it must be a precise match i.e. including colour, which was news to me !

!Wander (32K) – The quick-witted will spot the Cleesian name reference here. If you're bored with the birds flying around or need a change from a certain Deskduck (see Careware 2) then try these cute little goldfish that swim around the backdrop, blowing bubbles.

Info – provides important instructions for most of the programs on this disc.

PCDirV09h (128K) – a very well presented and implemented utility for reading IBM PC format floppies. When installed, an extra floppy drive icon appears on the icon bar, labelled A: which may be used just like the Archimedes floppy drive. You will be prompted for IBM PC discs and may then transfer files – via RAMdisc for speed – onto ADFS floppies or your hard disc. Likewise, ADFS files can be copied onto PC discs. PC file extensions will be converted to an appropriate ADFS file type e.g. .TXT becomes FFF, .BAS becomes FFB and vice versa. Furthermore, files can be dragged straight from a PC disc to an application such as !Edit and back again without the need for an intermediate ADFS disc. This utility is very well documented, works perfectly and must be worth several times the cost of

this Careware disc on its own. *(For a later version of !PCDir, see Careware Nº7. Ed.)*

Tunes.1 – a small selection of numbers from Genesis, Queen and Supertramp, very well arranged by Richard Millican.

Tunes.2 – a selection of classical and traditional pieces from Tom Measures including some Mozart, Haydn and Rossini.

Note that the Archimedes will drive external MIDI instruments to give vastly superior sound quality compared to the internal speaker.

Convert – consists of several programs which will convert files between Interword, PipeDream, View and Wordwise. It does this by converting files to a common 'liberator' format, which may then be converted to any of the other four formats.

FKeystrip – This BASIC program will produce function key strips on any Epson compatible printer. It will print out 5 strips on a normal fanfold sheet. Note that you may need to issue *IGNORE depending on your printer settings otherwise the whole lot will be on one line!

ScrBlanker – This module will 'switch off' your screen display if the computer is left unused for a certain time, thereby discouraging the old problem of 'burn-in' of the screen phosphors. The default time is 600 seconds which can be altered with *Blanktime t , where t is a time in seconds. If there is no keyboard or mouse activity after this time, the screen blanks out, returning immediately a key is pressed or the mouse moved.

Scrnfade – two BASIC programs for Modes 13 & 15 which can be used to fade out a screen image.

Summary

Where can you buy this much excellent software at such a low price and support charity at the same time? If you're not already buying Careware discs, now is the time to start. A

Careware Disc Nº 6

Tristan Cooper

Careware Disc Nº 6 is an Archive compilation of Public Domain software, including a combination of applications, utilities, games and music. There is sufficient documentation on the disc to get them running; in many cases a Help option is offered in the Menu window. !Sparkplug is provided to expand those that have been archived. The memory required by each application is shown after the name, where appropriate, below.

Hangman – You'll need to expand this onto a blank disc, as it is quite massive! An excellent implementation of this old favourite game, including excellent graphics, showing considerable attention to detail. You can add to the existing word lists or even make up your own using !Edit.

Lineof5 – Run from desktop, this is a very simple game in the same vein as Connect4 but it is remarkably difficult to beat the computer. Addictive and infuriating – you'll hate it, often!

Polymos – This is another huge suite of files that must be expanded onto its own disc. This ancient game uses pieces made of 5 squares in different configurations which must be assembled into the grid. Playable on many levels of difficulty to suit all ages, this demanding game should be part of your collection.

Music – contains twelve classical pieces from Schubert, Chopin, Beethoven and others; plus seven more modern pieces from various composers. Tom Measures has once again produced some very pleasing arrangements.

1stExtra (32K) – If you have any existing WP files that you want to use with First Word Plus (version 2), this utility will convert them quickly and efficiently. You install it on the icon bar, drag files to it and follow the menu options. It's very user friendly and converts both to and from First Word Plus format.

App_Maker – What an excellent idea! Click on the icon, enter a new application name (and size if necessary) and App_Maker will automatically create your !Boot, !Run, !Sprites and !Help files for you. You can then load these into !Paint, !Edit

etc to tailor them to your needs. Very useful indeed and well documented.

Evaluate (16K) – This is a desktop utility which will evaluate any mathematical expression that you can give it. At first sight, this looks very elementary but take a look at the Help file – this is a sophisticated utility which performs just about any maths functions you can imagine and you can tailor it by adding your own functions.

StickyBD (80K) – It's very easy to find the desktop cluttered with open directories and the files you want hidden somewhere in the morass. Here's the solution – you can pick any entry out of a directory window, drag it to the backdrop where the icon will 'stick', ready for later use. A neat trick – if you collect the various icons down one side of the screen, it's rather like having an extra icon bar.

SysUtil (96K) – There is no way I can do justice to this utility in a few lines! It's own text file telling you all about it is 13K long! In essence, it provides a wide range of desktop utilities including adfs functions; file finder; save function for system data, character set, configuration, sprites; directory manipulation; First Word Plus functions; and much more.

RFSMod – a desktop utility for use with Computer Concepts ROM podule giving the commands Free, Compact, Map and Podules.

Summary

If one is offered something at a very low price, it's easy to disregard it as being of little worth. If you are in any doubt as to the value of Archive's Careware discs then I strongly recommend you to invest in at least one. Take the time to give it a worthy test – and then send off for the rest of them.

At £7.00 a disc (£6.00 to Archive subscribers), these discs are seriously anti-inflationary. A

Silent computing – Is it possible?

Tord Eriksson

Silence is golden, especially when working in a small crowded room where everyone is using a computer, each with a fan, or external, fan-cooled drives that send you up the wall with their buzzing. Add to that a couple of laserprinters and dot-matrix printers....

Kill the fan!

The first problem for me was my noisy SCSI drive. This had worked flawlessly since it arrived by post, except for the din from the fan. After I realised that the fan tried to force air into a box that didn't have any exit holes for the air I drilled some holes in the lid and disconnected the fan. Now there was some air circulation through the box, anyway.

To improve matters even further I stood the drive on its end, but a friend, who knows computers better than most, told me to stop that immediately as the disc's bearings and other moving parts are made for sideways or flat mounting – anything else might be harmful. Having become a bit worried about excess heat that might harm the drive I reconnected the fan until I found the ultimate solution:

There are small thermostatic switches commonly found in fire alarm systems etc. These are either closing or breaking circuits. The switching temperature is typically 50 or 70° C in a fire alarm system (they are made in a wide range, with a switching range of around 10 degrees – to stop them from switching on and off all the time and wearing out prematurely).

A switch that closed at 70°C was, in my mind, perfect to put in series with the fan circuit. Lowering the drive to the lower mounting holes, probably intended for a high capacity drive, made room for the switch on top of the drive, with the sensitive surface against the upper drive surface, held in place by a piece of Armaflex foam. You have to bend the connectors on the switch as otherwise there is not enough room. Test the circuit by heating the switch with your soldering iron, with the power on to the drive. When the thermostat is heated, the fan should start and run for a couple of seconds. Until now the fan hasn't

started up as I seldom use programs that use the drive intensively, but it's nice to know that it is there when it is needed. I also fitted a dust-filter outside the fan, just to keep the inside clean. *(I haven't checked with Oak but I'm pretty certain that doing this would invalidate your warranty. Ed.)*

No impact printers!

The next step to silent computing is getting rid of noisy impact printers, such as daisywheel printers and dot-matrix printers, or put them in another room where no one is forced to listen to the racket.

Most laserprinters emit ozone, that is harmful to your health, usually have a noisy fan and are quite expensive. The modern ink-jet printer are quiet and less expensive than lasers, but are they good enough for a small office or the dedicated amateur?

Canon BJ-330 – Top of the range

Having used a KX-P1124, a typical 24-pin dot-matrix printer, for a year or so, I have found the print quality when printing Impression files quite amazing, good enough for the odd fanzine *(fan magazine? Ed)* or other non-commercial work. It has a weakness and that is NOISE and lots of it!

So when Canon Sweden kindly lent me a BJ-330, their biggest ink-jet printer, suitable for up to A3 format, I unpacked the huge boxes eagerly.

Everything taped down

The amazing number of pieces of reinforced tape that holds everything down on the printer and sheetfeeder must surely be gross overkill, but certainly nothing comes adrift!

There were three manuals included, one for us Swedes, one for French, German and English users and one Programmer's Manual in English. All these were flawlessly translated from Japanese; quite a feat!

The printer is quite handsome in grey plastic, with logos and control panel text in a darker grey. The only coloured items to be found are the yellow and green LEDs that adorn the control panel!

No low-level control

In contrast to the earlier bubble-jets from Canon (the BJ-10e and the BJ-130e) there is no possibility of low-level control of the printer, so the printer driver for the BJ-130e, available from EFF, does not work. Instead, the built-in Epson LQ-850 emulation is used with an Archimedes computer, as with my old Panasonic printer, so I didn't change a thing on the computer, just set the dip-switches on the printer according to the manual.

The printer can have two font cards, so in addition to the fonts built-in, you can add a number of fonts. Very useful for First Word Plus users, but of little importance to Impression users.

Printing

It is imperative that the printer is on-line before you tell the computer to print a document, otherwise it refuses to function. This is not so with my dot-matrix printer, but on the other hand that doesn't flush the print buffer if you abort printing (making a mess of the next print job) – so it is just a small inconvenience: To get things going you abort the printing, set the printer on-line and start the printing job once again.

Printing by dropping on the RISC-OS printer icon is the fastest I have seen! Printing Impression files is another matter – it will not enter Guiness Book of Records – but it is not the printer's fault!

The printer outpaces an A3000!

As the printer still is faster than my A3000 manages to send the bits to the printer, the printer head parks every five lines or so, leading to striped images, especially when printing large illustrations. Reading the PRM and the Impression manual and following their advice didn't help – no amount of Fontcache nor a huge system sprite area will solve the problem (An A540 would!).

The solution is to let the printer driver print to a file first, then send the finished bit-image to the printer. An A4 page can easily become bigger than 800K so you have to use a huge RAM-disc or your hard-disc for a perfect result.

To get the optimum result, you should use the LQ-850 emulation set to 360 x 360 dpi. If you want to use less ink, you just use the control panel to set the printer to HS, high speed. It makes the images a bit grey, but that might be the only solution if the paper doesn't soak up all the ink! When the ink is fresh it normally is quite wet and

needs to dry before using. So standard fan-fold paper isn't really up to it. I guess laser printer paper would be perfect.

The sheetfeeder

As my fan-fold paper wasn't useable, the ink spreading radially in the paper to make the result a mess, I had to use the sheet-feeder.

This is very straight-forward to install and functions perfectly, even with just one sheet of paper in the bin. There is even a possibility to fit a second bin, if need be. In short, flawless in operation!

Conclusion

I have never used a quieter printer than the BJ-330, nor one that could print on such big paper (a laser that could do it would cost a small fortune!).

Using it for draft-printing is a pleasure indeed, as it really flies and the sheet-feeder certainly works well.

To make originals for printing it is perfect, even if it isn't as fast as a Laser Direct (far from it!). I don't think you could see the difference between a page printed with a good laser printer and a page printed with a BJ-300 (for A4) or a BJ-330. I have never seen blacker printing and, with the right paper the result is perfectly all right for professional work.

The only thing that I did not like was the dip-switches in the back. I have to lean over the printer to change them and they are so very small! Why not have all controls up front?

Proof!

It is so good that I've sent these two pages to Paul for inclusion in next Archive as a full-spread illustration. Try to see any difference between it and any other page! A

Unfortunately, I couldn't use them, as Tord's English needed a little adjustment. Take it from me that the printout quality **is** *impressive for a non-laser printer – although I must say that I* **could** *tell the difference even between that and a 300 d.p.i. laser. Ed.*

ShowPage – Poor Man's PostScript!

Tord Eriksson

For some years now, PostScript has been synonymous with DTP and CAP (DeskTop Publishing and Computer Assisted Publishing) because this graphics programming language was developed by Adobe in 1982 just in time to be used by Apple on the then revolutionary Macintosh.

It has its origin as a programming language for complex three-dimensional databases (as used in CAD programs) called "Design System". It then developed into "JaM" (for John Warnock and Martin Newell) at the famous Xerox Palo Alto Research Center (where Windows, Icons, Mice and Pointers were conceived). This was used there as a multi-purpose language in experimental applications as diverse as VLSI design and graphics.

John Warnock, the leading man behind PostScript started, together with Chuck Geschke, a company called Adobe Systems Incorporated in 1982, that developed the language into a graphics description system and an interpreter for raster based printers such as typesetters and laser printers.

A flavour of Forth

Having grown out of a language that inherited many features of Forth, it still keeps to Reverse Polish Notation, that is, you write "`12 8 + 20 =`" and not "`12 + 8 = 20`" or "`0 0 moveto`" not, as in BASIC, "`MOVE(0,0)`".

This is probably the origin of the name of the language, as you add the operand as a post-script.

Showpage – a PostScript interpreter

Computer Concepts, famous for their Impression DTP and fast "hard wired" laser printers, have found a niche for turning a dumb, low-cost laser printer into a powerful PostScript printer. They do it by making an Archimedes do the heavy work of interpreting the PostScript file and then sending the bitmap over to the non-PostScript laser printer, such as the LaserDirect Hi-Res.

The main problem with PostScript lasers has been that they are either very slow or very costly, or

both. Some printers can be upgraded to PostScript standard by adding a PostScript card, probably costing anything from a couple of hundred pounds to thousands. The typical price difference of a standard laser printer with and with-out PostScript being £500 for the cheapest and £1000 for the bigger ones – upgrading later is always more expensive!

So, as an alternative to upgrading your printer, you buy Computer Concepts' Showpage and can still print your own and others' PostScript files at a reasonable pace, for less than the cheapest PostScript upgrade since Showpage retails at £149.00.

A big package

From Computer Concepts arrived a big box, slightly dented, containing a disc, with the interpreter, some utilities and some PostScript fonts, a manual about the interpreter, a number of registration forms etc and two big books from Adobe. Both these books were entirely made with PostScript, no cutting or pasting performed manually or with the DTP system involved. The result is very impressive!

Tutorial and cook book

One of the books is a thick reference manual that contains all the operands etc that are used in PostScript, with numerous examples that shows the language to be a pretty complete programming environment, even if it leans heavily towards graphical applications – I wouldn't recommend it for arcade-style games!

The other book is more interesting and consists of two books rolled into one: A tutorial that takes you from the first simple programming example (a line) to the rather complex workings of the image operator and how to get the most out of your Apple LaserWriter, the most widely available PostScript printer.

Part two is a "cook book" with complete recipes on how to make arrows, dash patterns, arcs (elliptical or not), how to set text as arches, in vertical columns, with small capital letters, how to create new fonts or modify old fonts etc.

"Program 18 / Making Small Changes to Encoding Vectors" is extra pleasing to a Swede as the text is a quotation in Swedish, made by one of the big names in typography, Valter Falk.

So there is much to learn about PostScript, especially how to make the most of it because all languages, artificial or not, take a long time to master.

The interpreter in use

Not having a PostScript printer, nor even a laser, I was curious about how the complex sample files, that are found on the disc, would print out on a ink jet printer (Canon BJ-330). As the printer is printing faster than my A3000 manages to send the bitmaps, I always send the bitmap to a file first before dumping it to the printer. A primitive printer-spooler, I know, but it prevents the printers time-out parking the head while printing the images, as that always leads to a minute misalignment of the printing head when restarting. With my 24-pin printer, there is no problem because it is much slower.

I can say, truthfully, that the results are amazing, both due to the complexity of the pictures themselves and due to the fact that the BJ-330 isn't made to print in this way. Even a 24-pin matrix printer produces good enough output to be used for proofing of PostScript documents.

Many of the sample files supplied are so complex that there is no way that you could produce them with any art package I know of. It shows how PostScript can be used as a creative tool, as well as a way of describing a piece of text.

Especially endearing is the way you can use a letter or a word as a mask, so that another text or pattern shines through, the mask being semi-opaque or whatever you want. I would love to have that function added to !DrawPlus, my favourite utility!

Next: Let us use PostScript!

To learn a language properly, you have to use it for a long time. I will give you a few small programming examples in the next part of this exploration into the world of PostScript.

(To avoid stepping on any sore toes and because US companies love to sue, I hasten to add that PostScript is registered trademark of Adobe Systems Incorporated.) A

The Archimedes Speaks

Robert Chrismas

Robert looks here at PEP Associates' Speech-System (£25) and Superior Software's Speech! (£19.95 or £19 through Archive). Two more speech programs are now just about ready: ARCticulate from 4th Dimension and DT-Talk from DT Software. Robert will look at these and report back as soon as he can.

Children can understand and speak English long before they learn to read and write. For most people, speech remains a more 'natural' form of communication. It is not surprising that so much effort has been devoted to enabling computers to produce and recognise speech. Computing experts soon found that it was easier to get computers to speak than to recognise and 'understand' speech. (The same is true for people but for different reasons.)

The clearest computer speech is obtained using samples of a person's speech, in effect using the computer as a digital recorder. Whole sentences can sound very natural but sampled sounds require lots of data so the number of sentences you can store is limited. It is possible to store individual words and to combine them to make sentences (you may remember Acorn's early attempts to do this using Kenneth Kendall's voice). However the vocabulary is still limited by the size of the computer memory. Also, once you begin to work with words instead of whole sentences, the speech begins to sound mechanical because of the difficulties of reproducing the natural patterns of rhythm, pitch and stress which usually reinforce the meaning of the utterance. Even the sounds of words may change in natural speech to facilitate pronunciation of some sound sequences.

Spoken English must include a high level of redundancy. If we listen to a sixteen stone male for Newcastle speaking over the telephone and a seven stone female cockney with a lisp shouting in the street outside the window we can understand both while still hearing the differences between them. Provided that the sounds have certain similarities with normal human speech, they are comprehensible even when it is clearly non-human, as anyone who has listened to Dr Who or Mr Punch well knows.

Phonemes

In English, we recognise about 50 unique sounds which allow us to identify words. These sounds are called phonemes. The phonemes are divided roughly into:

consonants e.g. the 'b' sound in 'bat'
vowels e.g. the 'o' sound in 'dog'

If a computer can utter these phonemes reasonably accurately, it can produce recognisable speech with an unlimited vocabulary.

Since these sounds have a fairly simple structure, it is not necessary to work with fragments of sampled speech – the computer can synthesise the sounds.

The programs

Superior Software and PEP have both produced programs which speak using synthesised phonemes. The packages sound different and they have different features. Each package includes:

- Documentation
- A desktop front end
- A module to convert English words into phoneme codes
- A module to convert phoneme codes into sounds

The packaging and documentation

Speech! comes in a CD pack with a single page of documentation and advertisements. The text refers you to help files on the disk which are more extensive. It is important to read the help files if only to learn that you should not attempt to write to the (protected) disk. The help files contain enough information to use the programs but they assume some background knowledge. In the worst case, the text refers to the 'second formant centre frequency' without explanation. You can get some idea of what it is by changing the frequency and listening to the effect, but more information would be helpful here.

SpeechSystem has a 54 page A5 manual. The manual is well written and it includes a helpful introduction to the linguistic background to the

program. It is disarmingly frank about its limitations. In a discussion of the difference between the sound of 'lead' in 'lead pipes' and 'lead singers' it says that the pronunciation depends on the meaning of the sentence which '...places the problem firmly in AI country, and beyond the scope of SpeechSystem in its current form'. Once you have installed SpeechSystem by entering your name, you can back up the disk. This form of protection seem to be the best compromise between user friendliness and copyright protection.

Neither package enables you to create speech fragments which can be freely distributed, so you can only give your creations to other people who have bought the programs.

Speech! front end

If you load the main program, !Speech!, and drag a text file to the program icon, the file will be read aloud. A window allows you to enter a line of words or phonemes to be spoken. The window also gives you control over the pitch, speed, level and both the second and the lower formant frequency (they affect the vowel sounds).

The !Sp_Dict application allows you to create new Speech! modules with modified pronunciation dictionaries. !Sp_Demo shows off the features of Speech! and includes talking pictures. Finally there is a drill and practice spelling program (educational theorists collapse in horror!).

SpeechSystem front end

Like !Speech! !PEP_Text will read text files dropped on to the icon. The text appears in a window with a set of tape recorder like controls. !PEP_Text can also speak words (or characters) as you type them, as I type this this into First Word Plus it is speaking each word. Another option causes any system text under the pointer to be read, so, for example, you can point to the file names in a filer window and hear each one spoken.

!PEP_Word allows you to create/edit a pronunciation dictionary. There are also two demos which you are free to distribute. One of the demos is included on the Archive 4.8 program disk; the speech quality is identical to SpeechSystem.

Words to phonemes translation

Beware of heard, a dreadful word,
That looks like beard and sounds like bird,
And dead: it's said like bed not bead,
For Goodness' sake, don't call it deed!
Watch out for meat and great and threat,
They rhyme with suite and straight and debt

In written English, spelling is determined by etymology not pronunciation. Of course, many words are spoken as they are spelt and most of the rest are covered by rules which leave only a few exceptions to be learnt by heart. People use rules to help spell words they have no difficulty pronouncing. For computer speech, the text is given, the rules must indicate how to pronounce the words.

SpeechSystem seems to have some powerful rules built into the program. If it fails to pronounce a word accurately you can create and edit a translation dictionary which is contained in !PEP_Lib using the !PEP_Word program. The dictionary is a list of words and the phoneme equivalents. The dictionary can only handle complete words, so if a word can take a number of suffixes and/or prefixes, each instance must be entered. The documentation avoids drawing attention to this requirement by using place names for its examples.

In the Speech! program, dictionary entries can deal with parts of words and they may include wild cards so one rule can cover many instances. For example 'i>#e_IY|' makes the 'i' before '<consonant>e' long as in 'line' and 'time'. Entries can even specify changes in pitch within a word. Because the Speech! dictionary is more versatile than that used by SpeechSystem, I think it would be possible to use it to create a dictionary to cope reasonably with words from a foreign language.

Changing the dictionary is less straightforward than with SpeechSystem. You must copy !Sp_Dict, then use !Edit (or similar) to change the dictionary in the application. The format given in the !Help file is wrong but it is easy to work out the correct rules by examining the file. When you have changed the dictionary, SP_Dict will create a new Speech! module.

As they are supplied both programs seem to aim for 'Received Pronunciation' (RP), the accent associated with educated people, the south east of England, the BBC World Service and Radio 3. Since this is a long way from my native Hampshire accent it was quite brave of Paul to send me these programs. With both programs, you can produce more accurate speech (or regional accents) by spelling phonetically *(spelng foneticly)*.

Speech using phonemes

Both programs allow you to enter speech as a sequence of phonemes. With Speech you use *SAY for words and *SPEAK for phonemes. SpeechSystem's *UTTER allows you to embed phonemes in ordinary text but the method of indicating phonemes is less compact.

```
*SAY TOKEN          Speech! words
*SPEAK TOWKOXN      Speech! phonemes
*UTTER TOKEN        PEP words
*UTTER {{ /t//ow//k//ax//n/}}
                    PEP phonemes
```

The programs use different letter codes to indicate phonemes. Speech! uses its own codes, apparently based on, but not identical to, those used by the BBC version of the program. Some of the sounds are rather hard to place. The help file gives 'OH' as the first vowel sounds in 'colour' and 'polo'; but these are different sounds in RP and most regional accents. SpeechSystem uses a standard code called 'Arpabet'. The documentation includes a table to convert from the International Phonetic Alphabet into Arpabet, so you can easily translate the pronunciation given in a dictionary into a form which the program can use.

SpeechSystem allows you to specify the overall pitch of the speech as part of a SWI. To change the pitch of individual phonemes you must alter bytes in the phoneme buffer directly.

Speech! offers OSCLIs and SWIs to set the overall volume and pitch as well as the formant frequencies. You can include numbers within a phoneme sequence to control the pitch of each phoneme, values 1–8 are speaking pitches, 10–57 cause the phoneme to be sung. Creating a song is fun but, to keep the tempo vowels must often be doubled or trebled. Even a short song takes a long time to enter, but it is possible to get results much better than the example, 'Daisy Daisy'. (This was, no doubt, inspired by HAL in 2001!)

In everyday speech, a change in volume, stress, is used to emphasise meaning. Neither program makes it easy to copy natural speech stress patterns but changes in pitch can be used for similar effects.

Quality

I wrote a program to allow listeners to compare the sounds of the programs and used twelve people, who had not heard the programs before, as subjects. To try to standardise the test, I use RP for all phonetic speech and I did not use any variations in pitch which would have depended on my own preferences. The results of blind trials showed that all the subjects found that Speech! sounded more 'natural' than SpeechSystem. This was probably influenced by the way Speech! runs the words together while SpeechSystem pauses between each word, but the pronunciation of individual words was also a factor. Speech entered as phonemes was not preferred significantly to words translated into phonemes by the programs, which indicates that both programs did a reasonable job of translating words into phonemes. When subjects heard a single word with no clues to its meaning they found it very difficult to identify the word when it was spoken with either program (about 30% of words were correctly identified). Afterwards, many commented that both programs sounded very mechanical. One said that Speech! sounded just like the BBC version and was surprised that the Archimedes could not do any better. I think I could have made some improvements to the examples provided with Speech! by tinkering with pitch etc, but there were not many ways of improving the SpeechSystem examples.

Summary

I enjoyed using both programs and I think they are good value. Both programs sound mechanical but Speech! less so than SpeechSystem. Speech! allows more variation of, and better control over, pitch and sound. SpeechSystem has better documentation and a better front end and the standard phoneme codes are more convenient. A

A Taste of APL

Alan Angus

In my first article I introduced the idea of using I-APL to explore the basic idea of functions. The example below uses the i function to assign the numbers 1 2 3 4 5 6 7 to variable S. The outer product operator "o." can then be used to make a multiplication table based on S, "So.xS", or an addition table, "So.+S". Other tables can be made by using S with another vector such as B shown in the examples.

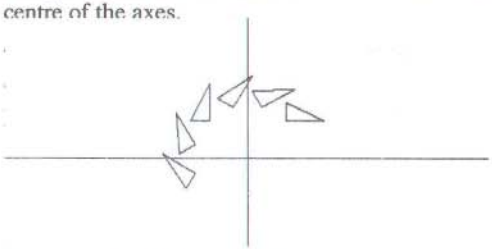
```
      S←⍳7
      S
1 2 3 4 5 6 7

      S∘.×S
 1  2  3  4  5  6  7
 2  4  6  8 10 12 14
 3  6  9 12 15 18 21
 4  8 12 16 20 24 28
 5 10 15 20 25 30 35
 6 12 18 24 30 36 42
 7 14 21 28 35 42 49

      S∘.+S
 2  3  4  5  6  7  8
 3  4  5  6  7  8  9
 4  5  6  7  8  9 10
 5  6  7  8  9 10 11
 6  7  8  9 10 11 12
 7  8  9 10 11 12 13
 8  9 10 11 12 13 14

      B←2 3
      B∘.×S
 2  4  6  8 10 12 14
 3  6  9 12 15 18 21

      B∘.+S
 3  4  5  6  7  8  9
 4  5  6  7  8  9 10
```

In the following examples, a set of values for a quadratic function are stored in variable V and this is used with R, which consists of the integers from −1 to 8, to give some crude graphical representations of the quadratic function. The "o." operator is used to set up tables of all the combinations of elements of V with those of R.

The first table uses "=" to test for equality, plotting 1 when they are equal and 0 when not equal. The second table uses a 'less than or equal to' test to produce a bar chart and the third table is a little more clever in that it uses indexing on the string '*' to plot with the ' ' and '*' characters instead of 0 and 1.

```
      X←⍳7
      V←(X-3)×(X-5)

      V
8 3 0 ¯1 0 3 8
      R←8 7 6 5 4 3 2 1 0 ¯1

      R∘.=V
0 0 0 0 0 0 0 1 0 0
0 0 0 0 0 0 0 1 0 0
0 0 0 0 0 0 0 1 0 0
0 0 0 0 0 0 0 1 0 0
0 0 0 0 0 0 0 1 0 0
0 0 0 0 0 0 1 0 0 0
0 0 0 0 0 0 1 0 0 0
0 0 0 0 0 0 1 0 0 0
0 0 0 0 0 1 0 0 0 0
0 0 0 0 1 0 0 0 0 0

      R∘.≤V
1 0 0 0 0 0 0 1 1 1
1 0 0 0 0 0 0 1 1 1
1 0 0 0 0 0 0 1 1 1
1 0 0 0 0 0 0 1 1 1
1 0 0 0 0 0 0 1 1 1
1 1 0 0 0 0 1 1 1 1
1 1 0 0 0 0 1 1 1 1
1 1 0 0 0 0 1 1 1 1
1 1 1 0 0 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1

      ' *'[1+R∘.=V]
   *     *
  *       *
  *       *
  *       *
  *       *
 *         *
 *         *
 *         *
*           *
*           *
```

I-APL does have access to better plotting facilities than this through the VDU drivers, but because of the implementation method used, it is rather slow. The screen dump shows a plot of a triangle transformed several times about the centre of the axes.



SHOW plots the shape on screen using data stored in matrix C. The shape is transformed by applying a transformation matrix T using matrix multiplication, e.g "T+.xC". This is used in line 5 of the procedure REPT which applies the transformation T a given number of times, plotting the new shape each time.

```
    ∇ SHOW C;COUNT;ENDC
[1]  ⍝Draws a shape using the co-ords of the corners in matrix C
[2]  ⍝The first and last co-ords must be the same for a closed shape
[3]   ENDC←↑C[1;]
[4]   POINT ROUND C[;1]
[5]   COUNT←2
[6]  M:DRAWTO ROUND C[;COUNT] ⍝ integer arguments needed
[7]   COUNT←COUNT+1
[8]   →⍵ IF COUNT>⍴ENDC
[9]   →M
    ∇

    ∇ REPT NUM;COUNT
[1]  ⍝ apply transformation T NUM times to shape C
[2]   C1←C
[3]   COUNT←1
[4]  LP:→⍵ IF COUNT>NUM
[5]   SHOW C1←T+.×C1
[6]   COUNT←COUNT+1
[7]   →LP
    ∇
```

The procedures TIN and CIN can be used to input new transformation and shape matrices.

```
      ∇TIN[⎕]∇
    ∇ TABLE←TIN;INPUT;Q
[1]  ⍝Input a Transformation matrix, 2X2
[2]   TABLE←⍬ 2⍴Q←0
[3]  GET:INPUT←2↑⎕
[4]   Q←Q+1
[5]   TABLE←TABLE,[1] INPUT
[6]   →GET IF Q<2
    ∇

      ∇CIN[⎕]∇
    ∇ TABLE←CIN;INPUT;Q
[1]  ⍝Input co-ordinate pairs, Q to end
[2]   TABLE←⍬ 2⍴Q←0
[3]  GET:INPUT←2↑⎕
[4]   →T IF∧/INPUT=Q
[5]   TABLE←TABLE,[1] INPUT
[6]   →GET
[7]  T:TABLE←2 1⍉TABLE
[8]   →⍵
    ∇
```

I am not trying to teach APL here, and so I will not explain the operation of these routines in any detail. The strange symbols used by APL are off-putting at first, but they are a powerful extension to the familiar symbolism of mathematics and well worth exploring. Get hold of a copy of the I-APL interpreter and an introductory book on APL and dive in!

All the functions listed here, plus others for saving screens to disk and making OSCLI calls etc, are in the workspace PLOT. I make no claims for originality in anything I have done. Some of the examples are lifted directly from Kenneth Iverson's "Introducing APL to Teachers", others are based on material from Howard Peelle's "APL, An Introduction" and the I-APL manual.

Norman Thomson's book, APL Programs for the Mathematics Classroom, is an excellent source of ideas and routines for using APL in mathematics education. This book, as well as many others, and the I-APL interpreter are available from, I-APL Ltd, 2 Blenheim Road, St. Albans AL1 4NR. A

DTP Clip Art

David Crofts

This article covers a variety of issues inherent in using Clip Art with Impression and other DTP packages.

A few months ago I wrote to Paul requesting assistance with sources of Christian Clip Art to use in Church publications. He placed a request in the Help! section and help duly arrived. My grateful thanks to all who responded. I hope that this article will in some way provide assistance for them in return.

I intend the text to be of general as well as specific interest, so all DTP Clip Art users please read on!

Sources

Clip Art is available commercially and through Public Domain libraries. Non-computer material is also available but will need to be scanned. A large selection can be found outside the Archimedes world in PC format – in fact the most comprehensive library is available, at a price, in PC Vector (Draw) format. It is possible to translate some of these formats, so I will include details of which format to choose later.

Formats

The two formats for Archimedes images are Paint or sprite format and Draw or object-oriented graphics. In the PC world, these correspond to 'bit-mapped' and 'vector' graphics respectively. Sprite/bit-mapped images are much more widely available and cheaper than Draw or vector format, but suffer from the problem of 'jaggies' – rough edges when enlarged and printed. Draw / Vector graphics images are much smoother and produce almost infinitely scalable images, and correspondingly better results.

It is worth mentioning here that converting sprites into Draw format is now possible with Midnight Tracer. Early reports suggest that it has limitations, it may be worth waiting for reviews before trying. *(See the comments on page 14. Ed.)*

Archimedes clip art

The first place to look for material is general clip art. Many images with non-religious subject matter can be relevant. A great deal is available through Public Domain libraries such as Archive Shareware and Careware! APDL of Cleveland, in addition to a wealth of sprite and scanned images include two religious sprite format discs. Midnight Graphics publish a five disc set of Draw format Clip Art – non of it specifically religious. Others of general interest are G.A. Herdman – Draw and sprite; Micro Studio who are building up an impressive collection library of Draw and Sprite pictures, many with education in mind; and David Pilling who has some interesting sprite images, some in colour.

Don't be surprised when collecting Public Domain material to receive identical files from diff-erent libraries! Public Domain seems to mean that anybody can sell you anything so long as it is free of copyright.

PC material

Another valuable source of material is the PC world. Some PC clip art is translatable into Archimedes format. I will detail my experience so far.

Firstly, by far the most comprehensive selection of religious Clip Art available, as far as I have been able to ascertain, is from MGA Softcat of Rye. Their Religious Special Edition Clip Art is available in Micrografix.DRW and other formats. It converts into Draw / vector images, but at a price! (£149.95 +VAT) The selection would satisfy most needs of most people for quite a long time. I have a photocopy of the selection, but have not been able to afford to purchase it! At a more realistic price is their set of Christian Symbols in bit-mapped format at £29.95.

Religious Clip Art is available on subscription from Beulah Graphics of London SW8. It can be supplied in TIFF, PCX and IMG format, all bit-mapped (sprite) images. The range of images is mixed, the majority specifically religious or biblical. Their PCX files presented translation problems, but fortunately they were able to provide TIFF as an alternative format.

I have seen an advert only for Vector Clip Art from "Words and Pictures" of Banbury.

Converting from PC format

To convert from PC to Archimedes format it is advisable to have to hand PC Dir, Translator, a set-type utility and Paint.

In my (limited) experience, with advice courtesy of Jim Markland, it seems best to try to obtain images in TIFF format.

1. If necessary, unpack these using the PC Emulator (with Beulah Graphics at least).

2. Move them across into Archimedes media using PC Dir (available on Careware 7).

3. Use Set-type (Shareware 19 or 23) to change to TIFF type (always assuming the file was a TIFF file in the first place!). This is filetype FF0.

4. Load Translator (Careware 7) onto the icon bar.

5. Double click on TIFF file. The screen will probably change to a strange grey mode and a box containing the converted image appears.

6. Click <menu> over the image. Run along the Save line to the list of save options. I usually choose 'Whole (scaled)' as the images may well need some alteration before saving (who needs an oval moon?).

7. Enter a filename into the box which appears, then, after <select> or <return>, the mouse pointer appears with the image completely under your power. A box giving the coordinates of the image you are about to save is appended to the pointer for precise scaling. It is possible to alter it to any shape size or scale you require (clever software – Translator) before clicking <select> to save it. (If you have made a mistake with the filename this is the moment of truth.)

8. GOTO 5 (who needs structured programming?) UNTIL all converted.

Using PC files in DTP

On conversion (not religious!), some files' whites are not 'Persil' bright. They seem to have a grey dotted background which is indistinguishable from white to the naked eye. Usually this only becomes evident on printing, when the image, rather than merging neatly into the white background of the paper, suddenly acquires a grey rectangular outline. Nasty! The solution? Load Paint. Use the replace colour option (a tipping up paint pot) to fill the 'grey white' with real white. Now your image is squeaky clean.

Other material

Pictures and features with a Christian theme, which could be scanned or cut and pasted with real glue, are available on subscription from two main sources: Church News Service and Christian Education Ltd. The material includes monthly titles, headers, captions, articles for adults and children, pictures, puzzles and jokes. (I preferred the CNS material for a British audience; CEL is Australian and has a distinctly trans-Atlantic feel.) Also Kevin Mayhew of Rattlesden produce three books of "Instant Art for the Church Magazine." Again, these could be scanned.

One respondent sent in some clever cartoons his sister had drawn. So any local artist may be pressed into service, even if the thought of a computer terrifies them.

See other articles for those who have experience of scanners.

What next?

Now those magazines, posters, leaflets, publicity materials, children's worksheets, service cards hymn sheets will be enlivened and brightened by

illustrations. For an example of use, Charles Constantine sent in his Church Magazine liberally illustrated with pictures and adverts. More generally available are the Patterns for Worship sample service cards from Church House Publishing which show how service material can be vitalised with illustrations.

Sources

MGA Softcat, 41, Cinque Ports Street, Rye, East Sussex. TN31 7AD (0797-226601)

Beulah Graphics, 276, South Lambeth Road, London. SW8 1UJ (071-622-8924)

Christian Education Ltd., Unit C, 41, Dace Road, London. E3 2NG

Church News Service, 37b, New Cavendish Street, London. W1M 8JR

APDL Public Domain Library, Mr Peter Sykes, 96, Lanehouse Road, Thornaby, Cleveland. TS17 8EA

Kevin Mayhew Ltd., Rattlesden, Bury St. Edmunds, Suffolk. IP30 0SZ

Words & Pictures, 30, Parsons Street, Banbury, Oxon. OX16 8LY (0295-258335)

Midnight Graphics from Dabhand Computing Ltd., 5 Victoria Lane, Whitefield, Manchester. M25 6AL

G. A. Herdman Educational Software, 43, St. Johns Drive, Clarborough, Retford, Notts. DN22 9NN (0777-700918)

David Pilling, PO Box 22, Thornton Cleveleys, Blackpool. FY5 1LR. A

Minerva Business Accounts

Mick Burrell

The Archimedes computer is a highly sophisticated machine and there is now a wealth of software available to utilise its capabilities to the full, but it still has not found a large following in the IBM stronghold of the business world possibly because of the lack of choice of business accounts software. Enter Minerva with their new business accounts package.

Initial impressions

Business accounts software, by its very nature, must be very complex but Minerva have worked hard and have, I feel, been successful in making it easy to use. Perhaps more than any other software, an accounts package will be used by people with little or no interest in computers other than as a tool. With this in mind, Minerva have presented the package well with an easy to follow (if a little daunting) manual. It comes as five separate modules – Invoicing, Sales Ledger, Purchase Ledger, Nominal Ledger and Stock Management (as yet no Wages package) – each of which will stand alone or integrate with any others you may have.

The manuals are well written in the now familiar style of tutorial and 'main' sections. Having read Paul's comments about a reviewer who admitted to not reading the manual, I dived straight in to the tutorial section.

The programs seems to run quite happily from wherever you store them. I have put them in a directory called Accs_Bus in the root directory of my 440's hard disc. Opening the directory and double clicking on the application's icon installs it on the icon bar. Clicking on the icon takes you into the main menu where you accept the date taken from the internal clock or enter another date (as is the case if you follow the tutorial).

Each of the manuals follows the same format and often uses very similar data so that if you have bought more than one module, the operations soon become familiar. Minerva have included some mistakes for you to type in and then they show you how easy it is to correct them! A good start – I was quite capable of making my own mistakes and it was nice to know already how to put them right. The manual is very insistent that you work through the tutorial section before trying to tailor the package to suit your own needs. This is well worth the effort, particularly if you are familiar with similar packages on PCs, as the tutorials aim to explore most of the facilities available. In practice, I felt that even having worked through the tutorials, this package offers

so much that I would still be discovering 'new' facilities after quite prolonged use. With this in mind, unless this review runs to a similar length to the manual, it can only really be my initial impressions.

Invoicing

The main screen shows which module you are working in, the date and, in this case, the invoice number you are looking at or working on. The 'card' itself is a smaller area which scrolls around quite happily under this heading. This is not multi-tasking and does not use the conventional windows but this presents no problem (to me at least!) and returns you to the desktop when you have finished. Typing in data is quite straight forward. From the name you put on the invoice (a minimum of three letters is all that is required for the system to find the customer) the system checks to see if it is an account that already exists and offers you the choice of opening a new account, making it a cash customer (meaning one you will probably only deal with this once), one or more customers who fit the description you typed in or re-entering the data.

For example, if you typed in 'Fre' as your name, the system would offer 'Free Range Eggs Ltd' as well as 'Fred Bloggs PLC' if these were already on file. You can then choose between them as they will be labelled 'A' and 'B'. Had you typed in 'Fred' then only 'Fred Bloggs PLC' would have been selected. The option to re-enter data is provided just in case you have made a mistake! One small problem occurred here – pressing <R> to re-enter details worked fine, but pressing <r> left me with a blanked screen which I could not get out of. This aside, entering invoice details is quite straight forward.

When you print an invoice, multiple copies are available, labelled Invoice, Despatch Note, Office Copy etc. depending on your requirements. These are set up when you get round to designing your own invoice. If you do not require a despatch note, you can set up the system so that you do not have one! One or two things are fixed however. For example, the system uses things like Invoice Number and so each invoice must have one! Not a serious limitation I hope. For the system to work properly, you should have two drives or a hard disc. Again, I would not imagine anyone prepared to buy and use this kind of software not having that hardware.

Setting up your own invoice system is not a task to be undertaken lightly. This has nothing to do with the software – it should be approached with the same care and attention you would use to design any of your business forms. You do, however, need to consider how the system will work best for you. Can I add to Minerva's plea – work through the tutorial first. I did, and yet I still made a few errors and had to start my design again. Only time will tell if a design is perfect once set up. An 'Invoice Reformat' option is, however, provided which will allow minor modifications even after the files have been in use. The system seems to be so versatile that it will probably cater for most needs with very little work.

Sales and purchase ledgers

Whilst these can again be stand alone packages, they will link to the others and, by their very nature, are similar to each other in task and operation. The tutorial sections are again very informative and take you through finding a particular customer/supplier by both account number and name, both methods being very fast. As with invoicing, a very detailed analysis is possible to keep track of the flow of goods into and out of your business (but see stock later) and leads to very detailed management reports (again see later). Movement around the files is similar to invoicing, although purely as a personal preference, I would like to use one key to gain access to the individual accounts and another to return to the menu. The <escape> key is used for both, but I have to admit to getting used to it even in the short time I have used the package.

One feature I liked particularly was the possibility of using of a small negative discount (2p in the example) to correct for a small over payment by a customer. I have never really understood why customers do this, but they do! In some accounts programs, you have to use the positive/negative adjustment procedure to make things balance. This effort is rarely worth 2p!

All of the usual features are here allowing simple reports of who owes you what and for how long (or vice versa!) but it can go far beyond this. (The manual has four pages devoted to explaining how reports can be produced.) One important report menu option is 'Second Criteria' which is set as default for a balance greater than zero, but is used with variables like 'lim' (the current credit limit) to produce reports of customers whose balance exceeds their credit limit by an amount you specify.

Reports generally can be short, medium or long, referring to the amount of information given. The short gives you the basic facts, i.e. the account number, name and amounts outstanding currently, for 30 days, 60 days and over 90 days. The long report prints in addition to this, details like the full name and address, your contact within the company, their credit limit, turnover and details of each transaction. In short this exploits what a computer is good at – fast accurate data retrieval to enable you to keep track of your business.

Nominal ledger

The nominal ledger program carries on this theme. In it you can record every transaction your business makes but this can, of course, be automatically taken from the sales and purchase ledgers if you have those modules. The ledger will allow over 8000 accounts (I have taken Minerva's word for this!) and comes with some of these set up to help get you started. You can print a profit and loss, balance sheet or a trial balance at any time. Comprehensive report facilities are available as well, and your accounting period can be set up to be anything from 12 to 18 months, so that if you are setting up a new business and will have your accounts on computer from day one, then this package can handle the first year trading being longer than one year.

Assuming that more people will have access to the computer than you would wish to have access to your accounts, a password facility is provided.

The tutorial is again well laid out and first of all introduces you to some accounts which, being used as headers for profit and loss reports, cannot be altered. They are a black card with white text to distinguish them from the normal blue card with white text. (Anyone using a monochrome monitor may find that this difference is not so obvious.)

Making alterations is much the same as in the other modules. Entries to the cash book are quite straight forward, as are the journal entries. As you would (probably) expect, the credit and debit totals for journal entries are shown at the bottom of the screen and must balance before you leave the posting.

It is, however, the reporting facilities that make this module really worthwhile. If you do your own trial balance manually or have watched your accounts clerk do it, you will know that hours can be spent looking for tiny amounts which stop the ledger balancing! To have this available at the touch of a key must make computerising your accounts worthwhile on its own! Period end and year end accounts are just as easily produced making it possible to have complete financial control over your business. I know of some businesses (no names naturally!) where the end of year figures their accountant produces are always a surprise. With this package you can produce these simply and quickly whenever you require them.

Stock management

At first sight, this module may not seem to fit in with the other four but Minerva are at pains to point out that they have called it Stock Management rather than Stock Control. The difference is in the amount of information this module is designed to supply when compared to more mundane stock control programs. The facilities you would expect are all here – stock levels, valuations, minimum levels etc but it also provides facilities to print out orders to send to suppliers and what is, according to Minerva, a unique facility to produce a pareto graph to 'highlight those stock items which account for a majority of your cashflow and hence require careful monitoring to maximise efficiency of your finances'.

In use, the program not only gives you accurate details of the items you currently hold in stock but makes suggestions as to what should be ordered and in what quantity. These are based on things like maximum and minimum stock levels

you have supplied, as well as stock movement and delivery lead times. A nice touch is that the manual tries to explain how the computer makes these predictions so that you can tailor it to suit your own business and its way of working. At all times, you still retain control over what the computer is about to do. For example, when it suggests an order to a supplier, you can manually adjust the amount if you wish to. This allows you to deal with seasonal fluctuations, new product launches, sales variations due to the weather or a thousand others things that a computer could not possibly predict but which you have to cope with to run a successful business.

If your business is in buying and selling items then this information will be vital and, of course, the computer will keep accurate records and not rely on the tapping your head "it's all up here" approach. This is a good stock management program and it will do the job admirably.

Conclusions

It is likely that anyone interested in this package will be considering computerising their manual accounts or possibly starting a new business. Readily available information on performance gives you extra control that over your business – the value of this cannot be over stated. Minerva have made this their main objective in producing these packages and have succeeded. Together, they will make your accountant's audit much simpler and quicker which will, of course, save you money – probably more than the cost of the package on the first audit! If you are currently using a similar package on a P.C., then I doubt that there are useful facilities you will find missing in Minerva's version.

A package of this complexity cannot be learned from scratch in five minutes and to get the most out of it will require time and a little effort. If you have experience of similar packages, the transition should be relatively painless. A well written and presented piece of software in which I found very little to complain about.

Well done Minerva! A

Shareware Disc Nº39

Geoff Scott

Shareware Nº39 has two sections; an educational one and a 'various utilities' one which occupies about twice as much space.

Algorithms

In a directory called Algorithms are four mathematical programs.

The first, **GraSort**, demonstrates to the user in a visual manner four popular algorithms for array sorting. It demonstrates the RISC-OS HeapSort SWI, a simple shellsort routine, an inefficient but useful SelectSort routine and the fastest known QuickSort routine.

PatMatch is a program holding three routines which were specifically designed to search for a text string within a piece of text. For those of you who are interested, the three search routines are a brute force method, a Knuth-Morris (KMP), and a Boyer-Moore.

The third program, **Travels**, claims that it will "demonstrate the modern simulated annealing technique" to attack the 'travelling salesman' problem. This type of problem is said to fall into the category of what a mathematician would call NP-Complete – taking a long time for a realistic number of variables. In English, this program will attempt to find the shortest route from the start, through several cities and then home again.

ZerFunc is said to search for the complex zeros of an arbitrary function of one variable using the Muller method. The Muller method was chosen over the Newton-Raphson one as it is more robust. As supplied, the program will graphically display the zeros of a polynomial, although full instructions are contained within the program if you find it necessary to change the function calculated.

The four programs within this section were all produced very well, with graphics used throughout to good effect. The only bad point I can make is the lack of multi-tasking, although all four return you safely to the desktop.

Chemistry
This program is an A-level science tutor which concentrates upon the building blocks and elements of matter – although to a far higher stage than GCSE. I took a brief look at this program and it is written in a way that makes it a pleasure in some ways to work with. However, the lack of a quit option is a bit of a drawback, although one can be added simply by altering the error handler. In short, if you are doing A-level chemistry – or even GCSE for that matter – I would recommend this disc just for the one program.

Desktop
The desktop directory is the holder of four draw files which are intended to help the user to access a menu option several layers deep by providing a reference chart which may be printed. The files can be printed out using the standard printer drivers, although on the screen, I noticed that they looked slightly cramped and confusing – a fact that would be replicated on paper. The use of these files would depend upon how confident you are with the Archimedes desktop and the Welcome suite of software – they could be ideal in an educational establishment or while introducing someone to the machine.

Economics
The two programs within this directory are for calculating compound interest and retail prices. The two programs have been written with many functions and if a use exists for them then they would be perfectly adequate.

Graphs
If you are fed up of graphs with very strange scale intervals then this program is for you! After looking at the values of the data, the program will fit the graph neatly onto a mode 0 screen.

Maths
7K worth of a mathematical routines library, with many functions including part-arrays, hyperbolic functions, sines, cosines, cartesians and virtually anything else you could ever need.

Photo
Two programs: Flash aids you in setting a close up exposure and DofField which aims to provide information about the depth of field of a shot.

BackSpr
The first application in the utils directory is BackSpr which takes a sprite and scales it to fill the screen and places the picture within a window at the back of the desktop, creating a backdrop effect.

Copier
This is an update of the disc copier on Shareware disc 2. It has a more colourful and graphical layout than the original version. It would appear that the workings of the program have been left alone, apart from making changes to recognise 'E' format discs and forcing the target disc to be formatted.

Compacted screens sequence creator
This program appears to have been written to facilitate the construction of sequences of pictures which have been compressed in some way. After looking at the modules provided, it is a shame that the front end for creating the sequences is such a violent beast to tame, but the effects I created were outstanding.

FileUtils
Fileutils is an application which provides many different utilities for file handling and various other file-associated operations. Operations currently supported are: change file type; a file search which will also search in any archives it encounters; a find space routine, the purpose of which is to find if enough space exits on a disc to hold the intended program.

FontConv
Amongst my collection of discs I knew that I had a font or two which came from a PC and, after digging them out, I left the machine to convert one of them. Firstly, the program informed me that every byte was an un-known command, and then it wouldn't let me return to the desktop – forcing a reset. *(It could be useful if you had the right type of PC fonts. Ed.)*

FPEcalc
A floating point calculator which does not multitask, requires system sprite memory and appears not to do anything I tell it. This program is in fact a 19 digit reverse-polish notation calculator with many functions.

STtoRhap

When I bought Tracker and found that it had no printout option, turned to the PD world looking for something to enable me to print the contents of my sound tracker file. STtoRhap appears to be the answer. SoundTracker files – not Tracker – can be converted into a format that Rhapsody will understand so that they can then be printed. I wouldn't however recommend trying to play the music from Rhapsody without making a number of changes to the score first.

Help reader

This program can be used to prepare help applications for other programs. It has many features such as jumping position using menus or buttons and multitasking in its own window. Excellent for anyone new to a program.

Overall

This shareware disc has been carefully compiled and, for £3, you can't really afford to miss it if you like the look of the programs on it. They are all thoroughly documented and can all be used with relatively little experience. A

Risc User Compilation Disc

Edward Hollox

When the RU icon is double clicked from the filer window, the icon installs itself on the icon bar and so provides information and a way of loading the selection of programs.

!ADPC

Which stands for "Advanced Desktop Presentation Creator". This utility installs itself on the icon bar and allows you to sequence numbers of sprites using different methods, such as scroll, explode and bounce, by simply dragging the files to the program window. You can then save the sprites, in a compressed form, in an application directory so that double clicking that application gives you the series of sprites interconnected by the different display methods.

However, you can only sequence mode 12 or mode 13 sprites, which limits the program. Not only this, but the program also tended to spout errors when saving which led me to believe that the program was not thoroughly tested. Well tried, but could do better.

!aMaze

The only game on the disc provided welcome respite from the disappointment of the previous program. The game is difficult to describe, but is basically a sliding block puzzle where up to four players can slide and then move their piece around the maze to collect various objects. The first person to collect the objects and return to base has won. Objects can be selected to be either from a dungeon, food, computer equipment or detective equipment. There is also a help facility.

Although simple, this game has good graphics and is certainly a break from shoot-'em-ups. Very good indeed. This game is also included on the Risc User Games Disc, which was reviewed in the January edition of Archive.

!Appmaker

A simple application which creates a basic sprite file and a !run file for a application of a specific size. Could be useful, but definitely nothing special.

!BEdit

Yawn! Yet another desktop front-end for the BASIC Editor. This one is no different to the millions of other ones I've seen in the Public Domain.

!Clipart

Draw files of a computer, the Union Jack, a guitar and some bells for inclusion in DTP.

!CMOSEdit

Double clicking this, results in a window full of numbers which apparently can be altered to change various CMOS settings. Although there is a help window, I'd stick to !Configure on Applications Disc 1.

!Encode

A desktop utility which, by simply dragging files to its icon, can code and decode files using a password system. Simple and very useful.

!Index
Only the index files for Risc User volume 3 for use in Arcscan.

!KeyStrip
A non-desktop utility which prints fully labelled keystrips on a 9 or 24-pin printer. Useful if, like me, you don't like making your own.

!Music
A selection of music for use with !Maestro, including pieces from Gilbert and Sullivan, Debussy and Bach.

!Newfonts
Three outline fonts, Chancellor, Katyo and Chinese, which are a useful addition to any DTP package. The fonts are high quality, though they would tend to be used for fancy headings rather than body text. Good, and far cheaper than elsewhere.

!Palettes
Colour palettes for better output on colour printers.

!PC_Disc
This program, very similar to the program !PCDir on Careware 5, allows the user to read, write, and format MSDOS discs on the desktop. If you have !PCDir, this is nothing special, but is certainly handy if you have the PC emulator and nothing like this program.

!StickyBD
This program allows the user to put icons on the background of the desktop, and to change that normally grey background to a pretty picture. A very good program, but it is in the Public Domain, so if you want it, it is bound to be on a Shareware disc or in any PD library's catalogue.

!Textprint
This allows text to be printed on an Epson FX-80 compatible printer in the background on the desktop, and is similar in presentation to the Acorn printer drivers. Could be useful.

!Watchdog
This excellent utility allows the computer to be vigilant for viruses on a hard or floppy disc. It has three levels of operation, selected from the desktop icon. Grey is no watch, amber stops *Wipe operations and red prevents all disc write operations. There is also an option for cleaning the free space of discs to stop viruses hiding there.

Conclusion
Although this is a reasonable disc with some good programs, £12.95 seems rather expensive. If you do not want the outline fonts, you could try a disc from a good public domain library or a Careware or Shareware disc from Archive. They would have programs of equal qualityand you can pass PD discs on to your friends. A

Chess Revisited

Tord Eriksson

There is one game that has become a classic for computer simulations – and is classic in itself – chess. From the long gone days of ZX80s and IBM 360s to today's supercomputers and IBM SPARCstations, there has always been a chess program around. Surprisingly few have been available for the RISC-OS user and only one has had a wide distribution – C. Granville's !Chess, available from David Pilling, P. O. Box. 22, Thornton Cleveleys, Blackpool, FY5 1LR, UK. The price is £5.99, VAT and p&p inclusive.

Not perfect
Version 1.00 of !Chess played a competent game of chess but could not in any way be called perfect. It did not realise that, when considering promotion, the option of turning a pawn into something other than a queen is sometimes desirable. Neither did it count the time elapsed very well as a two hour game easily ended up with two minutes or less on the clock!

If it got into a tight spot, it started to play like a randy young lad on his first date: The grand moves only made the prospects of success even more remote. Looked at positively, it certainly made the game-playing shorter but things were to change...

Enter version 1.28
The latest version looks exactly like its predecessors, fully multi-tasking, fully WIMPy etc, but it certainly is a different kettle of fish.

I did not have too much difficulty in beating the earlier versions but this version is too much for

me. It under promotes, it doesn't loose its marbles when in a tight spot and it seems to me play more quickly. As the clock now functions as advertised, it really can get your adrenalin flowing, as the computer is always miles ahead of you!

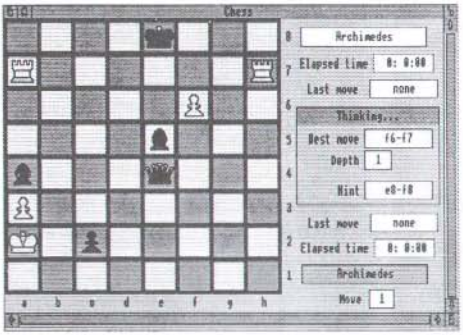
No field test

I have tested the earlier version of !Chess against chess programs run on Amstrad CPC 6128 and a Spectrum but I have not done it this time as the conclusion is all too evident: a massacre!

The verdict – unbeatable!

There are still a few things that could be added to make it perfect – 3D-view, maybe battling pieces as in Battle-Chess (probably copyrighted!) etc, but at the price it is offered I must say that it is surely unbeatable!

As usual, David Pilling will upgrade your version, if it has been legally obtained, to the latest version, by just sending him a blank disk and an SAE, with enough stamps on! That is better service than that by any other software producer I know of! A



Maddingly Hall

Gareth Bellaby

Maddingly Hall is a text adventure game from Minerva. The game is set in 1932 and you take on the 'Bertie Wooster' character of Bertie Hall who, having lost money betting on the horses, decides to pay a visit to Maddingly Hall and his rich Aunt Agatha. Also currently staying at Maddingly is Veronica, the young woman Bertie loves. Bertie hopes to win the heart of Veronica and persuade Aunt Agatha to part with a little of her money. Apart from these two general objectives, the aims and puzzles of the game are only revealed as the game is played.

Maddingly Hall needs 544K to start up. It is run from the desktop and will not disrupt existing programs if enough memory is available. The game is written in BASIC and is copy protected.

The game includes a picture for every location in the game. However, the graphics are occasionally inconsistent with the text, for instance displaying a non-existent window, and there is no facility to turn the graphics off.

The game is not that difficult and, in that sense, could be suitable for even a novice text adventure player. I say 'could be' because the game is let down by some extremely poor programming.The first failing of the game is in its treatment of the many independent game characters. For instance, one game character somehow managed to sit down to dinner whilst simultaneously being trapped in a secret passage and a second game character went through a locked door. Such anomalies completely undermine the spirit of the game.

Secondly, Maddingly Hall is let down by its often infuriating parser. No synonyms are given for nouns, although a few abbreviations are allowed. The parser unreasonably rejects certain words so that, for instance, you may be informed that you are wearing some "casual clothes" but the parser will only accept the word "cloth". Most importantly of all, the parser demands certain words which are not given in the game text. For example, at one point during the game you will need to refer to a "brickwall" but this word is not used anywhere in the text.

The game employs a reasonable level of humour, is based on a good scenario and has a number of interesting puzzles and frustrating red herrings. In particular, I like the way in which the nature of the game unfolds only as it is being played.

However, I cannot really recommend the game because I found it extremely annoying to be forced to struggle with the parser instead of getting on with the game. A

Fact-File

(The numbers in *italic* are fax numbers)

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